LOS ALAMOS NATIONAL LABORATORY

TWENTY-FIVE YEAR SITE PLAN

FY2013 - FY2037

Los Alamos NATIONAL LABORATORY EST. 1943

National Nuclear Security Administration

JULY 12, 2012
SITE PLANNING & PROJECT INITIATION GROUP
INFRASTRUCTURE PLANNING
LA-UR-12-22913

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1.0 EXECUTIVE SUMMARY

Los Alamos National Laboratory (the Laboratory) is the nation's premier national security science laboratory. Its mission is to develop and apply science and technology to ensure the safety, security, and reliability of the United States (U.S.) nuclear stockpile; reduce the threat of weapons of mass destruction, proliferation, and terrorism; and solve national problems in defense, energy, and the environment.

The fiscal year (FY) 2013-2037 Twenty-Five Year Site Plan (TYSP) is a vital component for planning to meet the National Nuclear Security Administration (NNSA) commitment to ensure the U.S. has a safe, secure, and reliable nuclear deterrent. The Laboratory also uses the TYSP as an integrated planning tool to guide development of an efficient and responsive infrastructure that effectively supports the Laboratory's missions and workforce. Emphasizing the Laboratory's core capabilities, this TYSP reflects the Laboratory's role as a prominent contributor to NNSA missions through its programs and campaigns.

The Laboratory is aligned with Nuclear Security Enterprise (NSE) modernization activities outlined in the NNSA Strategic Plan (May 2011) which include: (1) ensuring laboratory plutonium space effectively supports pit manufacturing and enterprise-wide special nuclear materials consolidation; (2) constructing the Chemistry and Metallurgy Research Replacement Nuclear Facility (CMRR-NF); (3) establishing shared user facilities to more cost effectively manage high-value, experimental, computational and production capabilities; and (4) modernizing enduring facilities while reducing the excess facility footprint.

This TYSP is viewed by the Laboratory as a vital planning tool to develop an efficient and responsive infrastructure. Long range facility and infrastructure development planning are critical to assure sustainment and modernization. Out-year re-investment is essential for sustaining existing facilities, and will be re-evaluated on an annual basis. At the same time, major modernization projects will require new line-item funding. This document is, in essence, a roadmap that defines a path forward for the Laboratory to modernize, streamline, consolidate, and sustain its infrastructure to meet its national security mission.

TAKE AWAY MESSAGE

The Los Alamos National Laboratory will continue to face a significant challenge over the next 25 years in balancing near-term needs while transforming the infrastructure to ensure long-term viability. The Laboratory must maintain a robust infrastructure to fulfill diverse, complex, and evolving missions in a period of flat or decreasing budgets. The large number of existing facilities will continue to age while safety, security, and compliance requirements will increase. The Laboratory must also continue to act as an environmental steward, reduce environmental risk, and improve sustainability.

This plan identifies strategies that will enable the Laboratory to provide a flexible, responsive infrastructure within available resources. At the end of the 25 year period, the Laboratory will have completed the following:

- Reduced overall footprint and consolidated nuclear infrastructure
- Constructed new facilities and reinvested in enduring facilities to support critical capabilities
- Completed projects to improve energy efficiency and long-term sustainability of resources
- Modernized the utility infrastructure to support future programmatic needs
- Completed legacy cleanup and implemented Long-Term Environmental Stewardship measures

Even in the face of new and significant pressures, the Laboratory will continue to take substantial steps to streamline operations, modernize the infrastructure, and fulfill its vision of being the premier national security science laboratory.

PRIOR YEAR ACCOMPLISHMENTS

Significant infrastructure milestones for the Laboratory include; completion of the Supplemental Environmental Impact Statement for the CMRR-NF, infrastructure and site improvement design for the Transuranic (TRU) Waste Facility (required for TA-54 Area G closure by the end of 2015), final design for Phase A of the technical area (TA)-55 Reinvestment Project (TRP) II, critical decision (CD)-0 for the Electrical Infrastructure Upgrades TA-3 Substation Project, and completion of the Sanitary Effluent Reclamation Facility (SERF) project and start of construction on the SERF Expansion Project. Additionally, the Radiological Laboratory Utility and Office Building (RLUOB) was the first facility at the Laboratory to achieve the Leadership in Energy and Environmental Design (LEED) Gold certification from the U.S. Green Building Council.

The Laboratory has also greatly increased the effectiveness and efficiency of its environmental stewardship activities—from cleaning up legacy waste and minimizing waste from continued operations to increasing recycling rates and reducing energy consumption and water use. The Laboratory worked to meet Consent Order and other regulatory commitments and worked with all regulatory entities to prioritize deliverables; shipped record quantities of TRU waste to the Waste Isolation Pilot Plant (WIPP) for the third consecutive year; completed $212 million worth of environmental cleanup projects, including excavation and disposal of contaminated soil and debris from Material Disposal Area (MDA) B; and effectively planned for future energy use by installing electric meters, supporting the development and commissioning of a new 3-megawatt hydroelectric facility to supply the Laboratory with renewable power, and developing a strategy to recycle rather than discharge millions of gallons of industrial wastewater.

CURRENT STATE OF SITE

Currently, the Pajarito Corridor development entails major infrastructure planning efforts for the Laboratory. The CMRR-NF substantial final design is being completed in preparation for a greater than five year deferral of the project; preparation for radiological operations at RLUOB are ongoing; the TRU Waste Facility Phase A site infrastructure sub project has started construction, and the Phase B facilities subproject is currently in design; the replacement Radioactive Liquid Waste Treatment Facility (RLWTF) is being designed; TRP II Phase C design is being initiated and construction is underway for Phases A and B; the Nuclear Materials Safeguards and Security Upgrade Project (NMSSUP) Phase II construction is nearing completion; and seismic improvements are being completed at PF-4. Two tanks in TA-50-0250 are being converted for daily influent storage in support of near term groundwater discharge reduction and future capability requirements.

In addition to the Pajarito Corridor development, further revitalization of TA-3 is being planned for future re-use of the vacant space created by the SM-43 Administration Building demolition. Pre-conceptual planning is also underway for a TA-53 signature science facility, Matter-Radiation Interactions In Extremes (MaRIE), as well as facilities at TA-3 and TA-16 needed to support the increasing core capability workload.

All major facility construction and refurbishment projects are now being designed to meet either LEED Gold or Guiding Principles (DOE O 430.2B) for sustainability and improved energy efficiency. An Energy Savings Performance Contract is currently underway that will reduce the Laboratory's electrical energy usage by more than three percent annually. Planning is also underway to refurbish and expand some aging institutional infrastructure, particularly the Laboratory's 115 kV and 13.8 kV electrical power systems, to meet the anticipated electrical power demand for exascale supercomputing.

The Laboratory continues to prioritize the protection of ground- and surface-water and to focus efforts on accelerating the shipment of aboveground TRU waste as a part of the 3706 Campaign. The Laboratory is meeting all scheduled Consent Order milestones established with the New Mexico Environment Department (NMED) addressing legacy contamination at the site.

CHANGES FROM PREVIOUS YEAR

Planning has broadened from a ten-year to twenty-five year outlook. A twenty-five year strategy for sustainable infrastructure supporting the capabilities at the site is a dynamic development. This strategy undertakes the compliance and reinvestment in enduring structures; the replacement of end-of-life cycle facilities; and new construction of modern facilities that are adaptable to changing missions.

FUTURE PLANS

Mission need requirements into the next decade are being considered for an Energetic Materials Characterization Facility, Weapons Manufacturing Support Facility, a Space Systems Instrumentations Building, a Nuclear Counter-Proliferation/Terrorism (NCP/T) facility, a Contained Firing Facility, reinvestment and renewal of radiological science laboratories, the Cogeneration TA-3 Steam System Reconfigure, and an enhanced TA-3 chilled water system. Upon anticipated completion of the CMRR-NF or alternative measure to accommodate the deferral, demolition of the Chemistry and Metallurgy Research (CMR) building is planned to commence. The viability of any of these projects will depend on the Laboratory's evolving missions, NNSA support, and out-year funding.

INFRASTRUCTURE RISK TO MISSION

Future Capabilities and Capacity Gaps: Over the next decade, specific elements and workload of the ongoing Weapons Program will be shaped by agreements and policies such as the new Strategic Arms Reduction Treaty and the Nuclear Posture Review (NPR). The trends toward a smaller operationally deployed stockpile will continue. As the stockpile becomes smaller, the premium on confidence in the weapons will grow, placing increasing demands on the science, technology, and engineering (ST&E) supporting the stockpile.

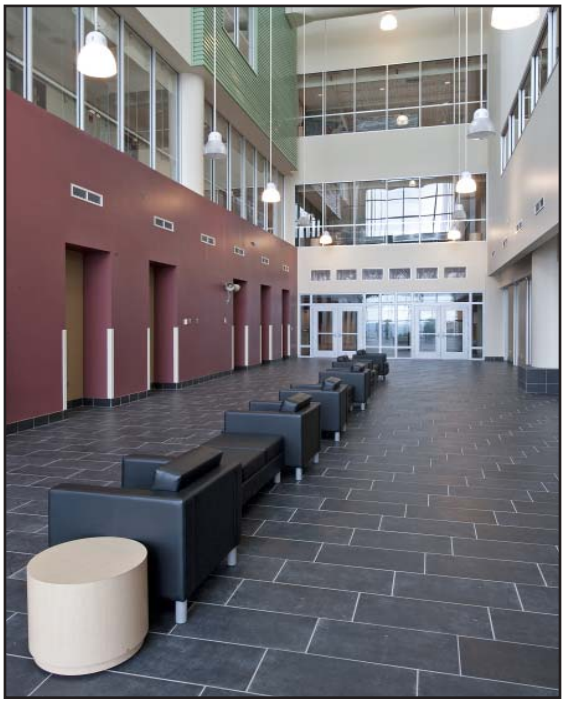
The Laboratory will continue to ensure the safety, security and effectiveness of U.S. nuclear deterrent and provide expertise in nuclear weapons ST&E that supports international stability and national security, consistent with the Laboratory's national security missions. However, the physical infrastructure supporting both direct-funded facilities and underlying ST&E capabilities requires recapitalization in order to provide continuing support for the nation's defense and global security. It is critical that the Laboratory receives adequate funding, on an annual basis, to support day-to-day facility operations and maintenance and continue construction activities to modernize and replace aging structures. Without a vital infrastructure, the Laboratory's ability to perform experimentation, modeling, simulation, design, engineering and production will be placed at risk, possibly creating gaps in our ability to certify the U.S. stockpile and our ability to support other important national security priorities.

Some of the infrastructure first developed for the nuclear weapons programs is filling a gap and now being applied to counterterrorism (CT), counterproliferation (CP), and work-for-others missions. For instance, some computing and laboratory space has been made available in a few TA-16 buildings that were vacated by the weapons programs. These Laboratory capabilities will continue to align with the changing nuclear weapons programs in a synergistic manner to ensure that the nation's investment in the Laboratory's weapons programs core capabilities remain vibrant and are usefully applied to broad national security missions. At the same time, demand from sponsors for additional program work within the CT and CP core capability continues to surface the need for additional facility space.

Maintenance: Current and out year Readiness in Technical Base & Facilities (RTBF) budgets are not adequate to support the level of preventive and corrective maintenance required to avoid the growth of deferred maintenance (DM). Institutional focus on the reliability of facility safety systems will also leave shortfalls in maintenance funding. Short-term solutions to these maintenance funding gaps include continued investments through Facility and Infrastructure Transformation (FIT) projects, which will reduce DM on mission critical (MC)/mission dependent (MD) facilities, and improve efficiency through consolidation and footprint reduction initiatives which will redistribute funds to facilities with high priority maintenance needs.

Environmental Issues: Under the Framework Agreement jointly developed by the Department of Energy (DOE)/NNSA and the NMED, the Laboratory will continue to address the highest environmental risk by focusing on TRU waste within TA-54. The Laboratory will continue to work closely with NMED to assure that investigations and corrective actions meet all compliance requirements and are carried out in a cost effective and efficient manner that provides full protection of human health and the environment. The Laboratory also works with other regulatory entities to assure that their compliance requirements are met. Additionally, the Laboratory has developed a 50-Year Environmental Stewardship Plan that defines strategies and tactics for addressing past legacy issues, controlling present emissions, and creating a sustainable future.

Above: In 2011, the Laboratory shipped record quantities of TRU waste to the WIPP for the third consecutive year.



Right: The Radiological Laboratory Utility and Office Building was the first facility at the Laboratory to achieve the Leadership in Energy and Environmental Design (LEED) Gold certification from the U.S. Green Building Council.

2.0 SITE OVERVIEW AND SNAPSHOT

Location: Los Alamos, New Mexico

Type: Multi-Program Laboratory

Web site: http://www.lanl.gov

Contract Operator: Los Alamos National Security, LLC

Responsible Field Office: Los Alamos Site Office

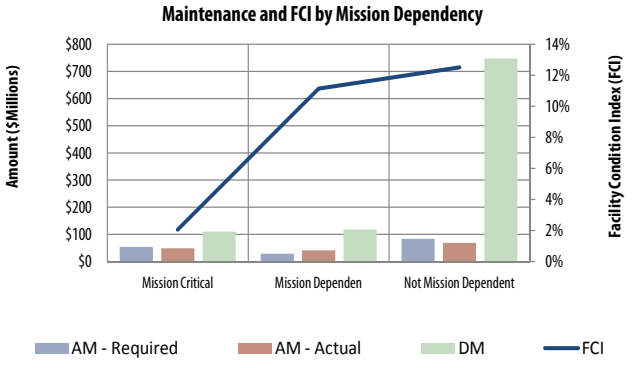
Site Manager: Kevin W. Smith

Los Alamos National Laboratory (the Laboratory) was established in 1943 as a secret, centralized site to coordinate scientific research of the Manhattan Project, an Allied effort to develop the world's first atomic weapon. Located approximately 25 miles northwest of Santa Fe, NM, the remote location was ideal because it provided controlled access, steep canyons for testing high explosives (HE), and some existing infrastructure (Figure 3). Following the end of World War II, the Laboratory expanded operations while continuing to provide significant contributions to the nation's science and defense programs. A unique array of facilities and infrastructure were built during the Cold War to accommodate weapons research including special nuclear materials (SNM) and HE. Many of those unique facilities are now obsolete and need to be refurbished or replaced to sustain the Laboratory's current core capabilities, which include: (1) Design; Certification; Testing; Experiments; Surveillance; and Science, Technology, and Engineering (ST&E) base; (2) Plutonium; (3) Tritium; (4) HE; (5) Non-nuclear; (6) SNM Accountability, Storage, Protection, Handling, and Disposition; (7) Enabling Infrastructure; (8) Counterterrorism (CT) & Counterproliferation (CP); and (9) Support for Other Mission/Program Capability. A real property snapshot of the facilities supporting these core capabilities is shown in Figure 1.

The Laboratory is the largest institution in northern New Mexico with an annual budget of approximately $2.2 billion in fiscal year (FY) 2012. The majority of funding comes from the National Nuclear Security Administration (NNSA) Weapons Program (56%), supplemented by funds from Non-proliferation (9%), Environmental Management (8%), Security (6%), Emergency Response (2%), other Department of Energy (DOE) programs (8%), and non-NNSA programs (11%) (FY2011 funding details are captured in Figure 2). With a total workforce of approximately 10,400 people (as of 4/30/12), Laboratory affiliated personnel include craft employees (7.4%), flexible workforce (12.2%), post-docs & students (12.9%), executive (0.4%), managers (9.5%), support (2.7%), professional (28.9%), and technical staff (26%). Management of the Laboratory is the responsibility of Los Alamos National Security, LLC (LANS) which is comprised of four top United States (U.S.) organizations—Bechtel National, University of California, Babcock and Wilcox Company, and URS Energy & Construction, Inc.

Figure 1: Real Property (end of FY2011 FIMS reporting)

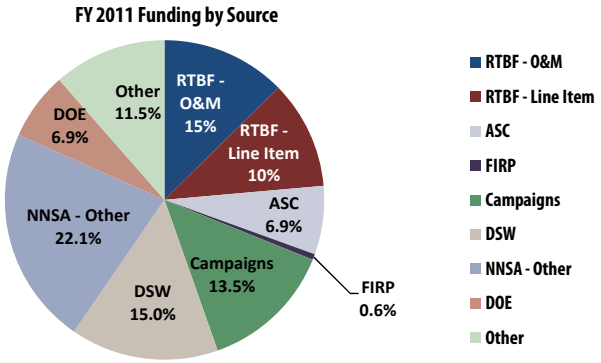
- 26,322 Acres (Leased / Owned)[1]
- 1,104 Buildings/Trailers:
  - 7,794,490 gsf Active & Operational[2]
  - 333,918 gsf Non-Operational[2]
  - 446,302 gsf Leased
- Replacement Plant Value:[3] $12,573,742,287
- Deferred Maintenance:[2] $975,855,296
- Facility Condition Index:[2] 7.9%
  - Mission Critical 2.1%
  - Mission Dependent 11.1%
  - Non-Mission Dependent 12.5%
- Asset Utilization Index (Overall):[4] 98.9%



1. Includes Rendija Canyon & Outgranted Land (Research Park, Landfill, ICON facility, Interagency Fire Center, KRSN radio tower, VLA satellite dish) Does NOT match FIMS due to land transfer
2. DOE owned real property (buildings, trailers, other structures)
3. DOE owned real property and leased facilities
4. DOE owned, operational gsf

Figure 2: FY2011 Funding by Source

- FY 2011 Total Site Operating Cost: $2,554M
- FY 2011 Total NNSA Funding: $2,055M
- FY 2011 Total DOE (non-NNSA) Funding: $187M
- FY 2011 Total Other Funding: $312M



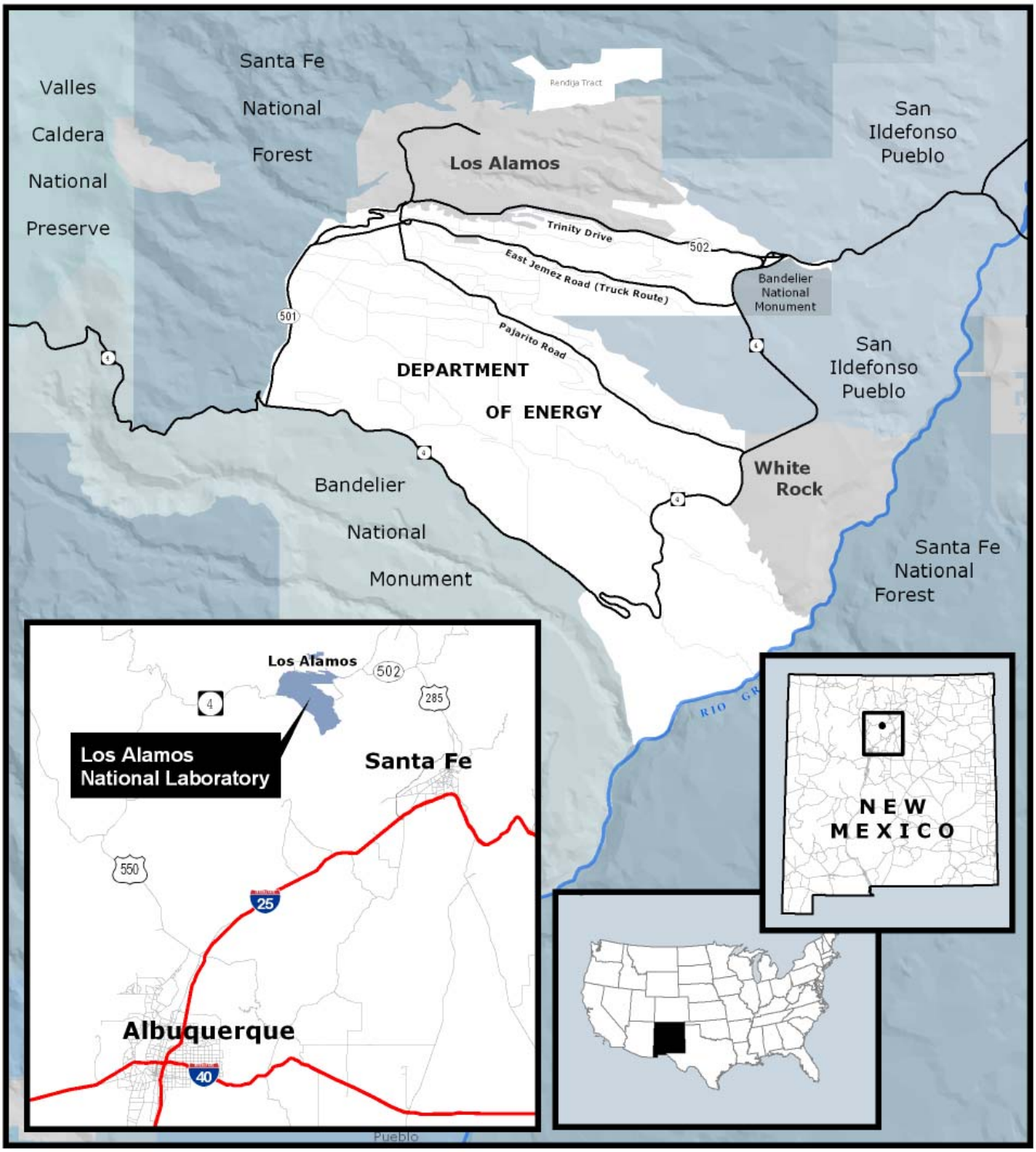


Figure 3: Location Map of Los Alamos National Laboratory

3.0 ASSUMPTIONS

PROGRAMMATIC

Primary drivers for the FY2013-2037 Twenty-Five Year Site Plan (TYSP) include the 2008 Complex Transformation Record of Decision (ROD), 2010 Nuclear Posture Review (NPR), FY2012 Stockpile Stewardship and Management Plan, FY2011-2041 Corporate Physical Infrastructure Business Plan (CPIBP), 2011 Amended ROD for the Nuclear Facility portion of the Chemistry and Metallurgy Research Building Replacement (CMRR) Project, and the November 2010 Construction Working Group–Integrated Construction Alignment Plan. Based upon key directives from these documents, it is assumed that the Laboratory will continue to support warhead surveillance and stockpile assessment science and technology to ensure certification in the absence of underground nuclear testing. The Laboratory will also continue to meet the immediate needs of the stockpile, including production and Life Extension Program (LEP) commitments and milestones. Meanwhile, the Laboratory will continue to strengthen its ST&E base by developing and sustaining high quality scientific staff and maintaining the ability to design nuclear warheads, including development and engineering expertise and capabilities.

In support of these programmatic missions and as part of the Department's strategy for creating a smaller, safer, more secure and effective physical infrastructure, the following assumptions are made about key Laboratory infrastructure projects:

- CMRR-NF is currently planned to be completed no sooner than 2025 with beneficial occupancy anticipated approximately two years later. These dates are consistent with NNSA's FY2013 President's Budget Request that defers the CMRR-NF construction by at least five years.
- Radiological operations in the Radiological Laboratory Utility and Office Building (RLUOB) laboratories will commence in FY2014.
- Reinvestments will be made in the PF-4 infrastructure (TA-55 TRP II) and waste processing capabilities (RLWTF and the TRU Waste Facility).

BUDGET

Funding profiles in this TYSP are consistent with the FY2012 Future Years Nuclear Security Program (FYNSP), and the President's Fiscal Year 2013 Budget Request. It assumes resolution and adoption of the FY2013 budget request; completion of the Facilities and Infrastructure Recapitalization Program (FIRP) funding in FY2012; initiation of the Capability Based Facilities and Infrastructure (CBFI) program; continued funding for clean-up of process contaminated structures, Consent Order activities, and accelerating the shipment of TRU waste; and institutional funding for footprint reduction, reinvestment, new construction, and replacement of non-weapons program facilities. While Readiness in Technical Base and Facilities (RTBF) funding will be sufficient to at least minimally operate most facilities, FYNSP targets reach only about 70% of the requirements levels in FY2014 through FY2017.

PLANNING

Maintenance: A site-wide Maintenance Implementation Plan (MIP) will continue to be updated annually to define the maintenance activities required for integration, evaluation of staffing needs, and prioritization of required work. An Annual Maintenance Work Plan will be prepared for each facility or area to identify activities and resources needed to accomplish Laboratory maintenance. Each annual maintenance work plan supports the annual update to the TYSP. Disposition funding will continue to eliminate obsolete/non-sustainable facilities, allowing for the avoidance of associated deferred maintenance (DM) while directing maintenance funding toward enduring facilities. Condition assessments will continue to provide a better understanding of facility condition and consequently equip the Laboratory with better information to prioritize maintenance spending.

Disposition: Investment from several programs is anticipated to continue the footprint reduction progress made over the last decade. The three principal funding sources currently anticipated include: Environmental Management to address process-contaminated facilities at TA-54, Laboratory Institutional funding to address small structures (especially trailers/transportable), and NNSA funding to address a significant number of buildings currently shutdown/excessed, as well as those anticipated to be shutdown over the coming years. While the FIRP program (which has removed almost 500,000 gsf since 2002) is coming to an end in FY2012, initiation of NNSA's new Footprint Disposition Program (FDP) is proposed for FY2014.

For an enduring site such as Los Alamos, timely removal of obsolete structures following completion of the shutdown/excessing processes is the optimal approach for reducing cost, minimizing risk, and maximizing program opportunities. Over time, all enduring sites will have structures that reach the end of their viable lifetimes and need to be removed. A national program to quickly address the elimination of obsolete structures before an even more significant backlog is realized will provide a practical and efficient infrastructure strategy. At present, however, elimination of the current backlog remains a principal challenge. The proposed FDP program addresses these needs.

Capability Based Facilities and Infrastructure: The Laboratory provided a prioritized project list consistent with the requirements of the CBFI data call and will continue to evaluate potential projects and support the planning and execution of the CBFI program as it matures.

4.0 CHANGES FROM PRIOR YEAR TYSP

Managing the Stockpile

- A major change in the investment strategy schedule is the decision to delay the CMRR-NF by at least 5 years. The CMRR project began in FY2004 with anticipation of constructing the RLUOB and NF. In FY2012, RLUOB took occupancy while construction of the NF was delayed by at least 5 years.
- The funded LANL Electrical Reliability and Distribution project will modernize the aging power transmission and distribution system in support of enduring facilities, faster computing, the long-term MaRIE project, and in anticipation of future facilities addressing mission requirements.
- Life extension projects to major stockpile facilities are being planned in the 10- 25-year horizon.

Preventing Proliferation

- Planned refurbishment and replacement of laboratory and office space will support the counterterrorism & counterproliferation capability and supporting science.

Emergency Response

- Planned investments in the HE capability, science research and development (R&D), computing, and support of other mission program capabilities will enhance the training and response to global emergencies.

Continuing Management Reform

- A tactical training facility and an indoor firing range will attain occupancy in FY2012. Investments in protection systems and facilities, including upgrades to security posts and sustainment of enduring facilities, are anticipated.

Recapitalizing Infrastructure

- The RTBF-CBFI program will invest in MC/MD facilities life extension, utility, sustainability, fire protection, and related projects. These investments will ensure the readiness of these facilities.
- The FIRP program will end with the disposition of structures at TA-18 and corrections to deficiencies in the electrical system. This program has made a significant impact on deferred maintenance reduction.
- Investing in life extensions for enduring non-mission dependent (NMD) facilities are planned throughout the next 25 years. Major projects include the institutional computing and physical sciences facilities. Refurbishment of the Omega Bridge and major roads will support all core capabilities. Replacement and upgrades to aging utility systems are being planned and implemented, including upgrades to the electrical system and a steam plant replacement. Projects supporting the sustainability of enduring facilities are ongoing.
- Investments in the restoration and preservation of historic facilities considered for inclusion in the limited public access Manhattan Project National Historical Park will continue to protect these historic facilities. Federal legislation for this Park is currently underway.

5.0 FUTURE VISION AND CORE CAPABILITIES

DESIGN, CERTIFICATION, TESTING, EXPERIMENTS,SURVEILLANCE, AND ST&E BASE

The Laboratory performs basic scientific research, design, system engineering, development testing, reliability assessment, and certification of nuclear weapons. In 1995, the President concluded that the continued vitality of all three nuclear weapons laboratories was essential to the nation's ability to fulfill the requirements of stockpile stewardship in the absence of underground nuclear testing. The Laboratory maintains responsibility for the nuclear design and engineering of its nuclear physics packages and utilizes exceptional ST&E capabilities to preserve the U.S. nuclear deterrent and support the W76-1 and B61-12 Lifetime Extension Programs (LEPs).

TACTICAL PLANNING HORIZON (FY2013-2022)

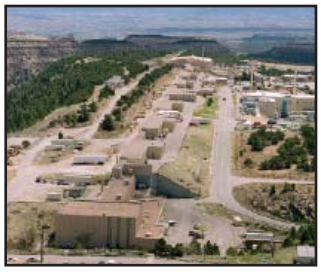
Dual Axis Radiographic Hydrodynamic Test Facility Operations: DARHT (15-0312) is used to perform integrated, non-nuclear experiments designed to measure the many complex and dynamic aspects of implosion systems, shock physics, and high velocity impacts. In early 2008, the Laboratory received authorization from NNSA to begin operating Axis 2, and DARHT fired its first ever double-viewpoint hydrodynamic test of a nuclear weapon component mockup in late 2009. DARHT is expected to provide an enduring contained hydro-testing capability for the Nuclear Security Enterprise.

Nicholas C. Metropolis Center for Modeling and Simulation: This facility (03-2327) houses the Roadrunner supercomputer (peak speed of 1 quadrillion operations per second), which was installed in 2009 and is used to perform advanced physics and high-end predictive simulations to meet weapons assessment and certification requirements, including weapon codes, weapons science, and platforms. Cielo, the next-generation petascale capability-class platform for the Advanced Simulation and Computing (ASC) Campaign has more than ten times the computing power of the supercomputer it is replacing. Cielo was approved for classified operations in March 2011. Cielo will enable scientists to increase their understanding of complex physics, as well as improve confidence in the predictive capability for stockpile stewardship. It runs the largest and most demanding workloads involving modeling and simulation, primarily for milestone calculations. After Cielo, the next platform, Trinity, will introduce key elements of technologies deemed necessary as the stepping-stone towards exascale computing. Exascale computing, which is the ASC Roadmap target for 2018, will be a thousand-fold increase in computing capabilities over the current petascale platforms. Installation of Trinity will begin in 2014 with anticipated completion in 2015. A number of upgrade projects are required at the Metropolis Center to provide adequate electrical capacity to support future computing missions.

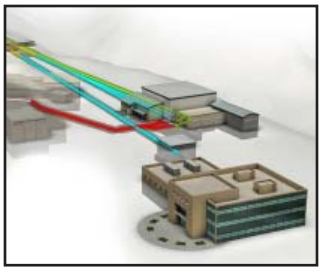
Los Alamos Neutron Science Center Facilities: The LANSCE facilities consist of a high intensity 0.8 Megawatt (MW) proton linear accelerator (53-0003), a proton storage ring (53-0008), neutron target systems at the Weapons Neutron Research facility (53-0369) and the Manuel Lujan Jr. Neutron Scattering Center ("Lujan Center") (53-0622), and associated beam lines and detector systems. LANSCE contributes to the Los Alamos stockpile stewardship mission through the exploration, development, and application of particle accelerator-based science and technology to provide new tools to help ensure the safety and reliability of the nation's nuclear weapons stockpile. Weapons research at LANSCE provides answers to fundamental questions that arise in the stewardship of an aging nuclear stockpile. Researchers use neutron and proton beams as penetrating probes to study weapon components and materials. LANSCE helps to maintain a set of core technical competencies that are critical to the Laboratory's mission, including advanced materials science, particle-beam technology, and nuclear science.

Dual Axis Radiographic Hydrodynamic Test Facility (DARHT)

Nicholas C. Metropolis Center for Modeling and Simulation Facility



Los Alamos Neutron Science Center (LANSCE)



Proposed Matter-Radiation Interactions in Extremes (MaRIE) Facility

Materials Science Laboratory (MSL)

LANSCE's reliability has been under increasing stress over the past few years. Major components have become obsolete, demonstrated failure, and are operating years beyond expected service lives. Replacement part fabrication could cause a one-year shutdown. The Linear Accelerator Risk Mitigation (LINAC RM) projects are a compilation of beam line and infrastructure sub-projects that will focus on renovating and modernizing the existing linear accelerator and related systems. The projects are designed to sustain reliable facility operations past 2020 for defense research and applications with a priority on dependable beam delivery. Funding for Phase I of the LINAC RM projects was initiated in late FY2010, and work was initiated in FY2011. Additional phases are planned through FY2017.

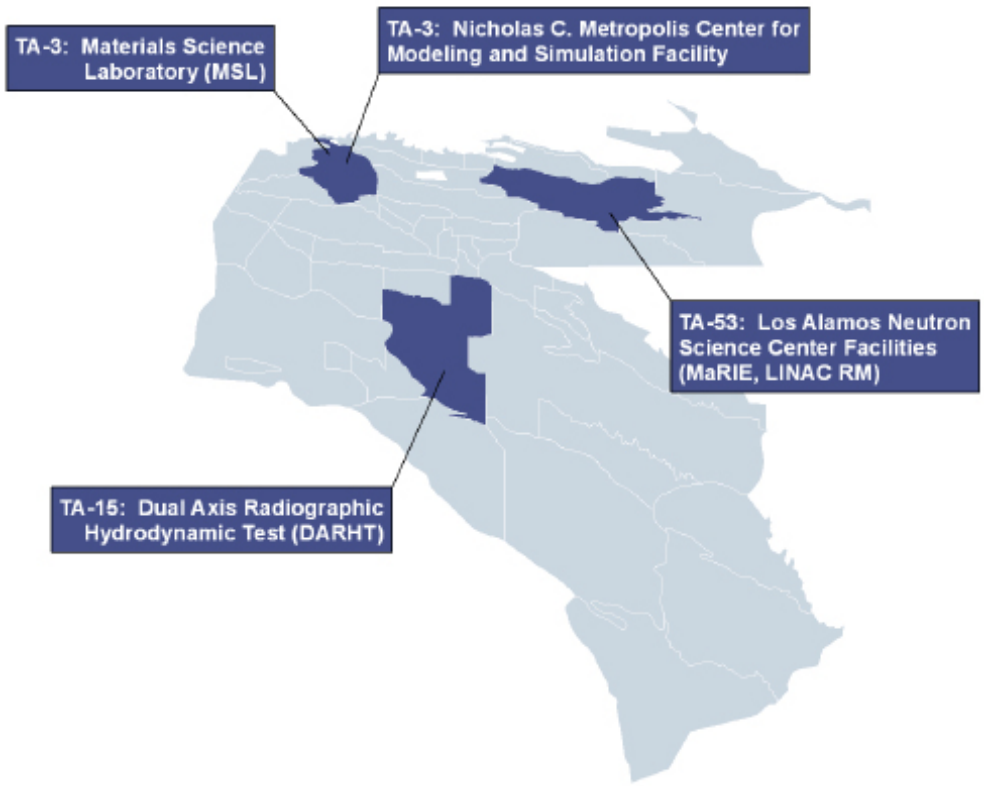
The proposed science magnet and signature facility, MaRIE, will provide a vital increase in Laboratory capabilities for materials research at LANSCE. MaRIE will integrate a state-of-the-art materials synthesis and characterization capability, a dynamic extremes environment, and a materials irradiation environment with diagnostic tools. The mission need fulfilled by MaRIE 1.0 is to close key gaps in our ability to understand the condition of the nuclear stockpile and to extend the life of nuclear warheads by observing and ultimately controlling how mesoscale material properties affect weapon performance. Pre-conceptual planning and project scoping for MaRIE will continue in the near term.

Materials Science Laboratory: The MSL (03-1698) supports four types of experimentation: materials processing, mechanical behavior in extreme environments, advanced materials development, and materials characterization. The MSL is in excellent condition and only minor life extension related projects are currently planned. A project to construct new laboratories in an unfinished part of the second floor is underway, and these labs will support chemical synthesis, characterization, and preparation of new materials.

Other ST&E Base Facilities: An array of materials science and engineering facilities and capabilities support hydrodynamic testing at DARHT, stockpile life extension, and other stockpile stewardship needs. Chemistry and geosciences capabilities support Weapons and non-proliferation/other national security missions with capabilities for measurement, analysis, and forensics. Actinide science capabilities at the Laboratory remain an important resource enabling NNSA mission delivery. A range of experimental and theoretical capabilities provide critical contributions to quantification of margins and uncertainties (QMU) and to science-based prediction of complex systems for nuclear weapon stewardship and threat reduction. Many of the facilities supporting the base ST&E capabilities are aging and deteriorating, and planning is ongoing to identify required reinvestments or new construction.

STRATEGIC PLANNING HORIZON (FY2023-FY2037)

No major imminent changes are expected for mission, program areas, and workload currently assigned to the Laboratory, although there will be program progression to address evolving national security and other challenges. Planning is ongoing for the 25 year time frame to determine what facility reinvestments or new construction will be required to meet mission needs for those facilities in the near term.



PLUTONIUM

The future stockpile is projected to be smaller, leading to changes in the associated production requirements which are currently under evaluation. The Laboratory is responsible for key nuclear components within the majority of active weapons systems. Most notably, TA-55 provides the only fully functioning plutonium facility used for R&D and the only pit manufacturing capability within the NSE. The Laboratory was named a consolidated Center of Excellence for plutonium research, development, and manufacturing activities. The Laboratory's mission is to lead science, engineering, and technology development across a broad range of plutonium-centric programs, with a continuing responsibility to manage and understand the material in all applications.

The Laboratory, through existing capabilities and planned nuclear facility consolidation and modernization activities, has established a stable weapons infrastructure to meet near-term manufacturing needs, but additional capacity for expanded pit production is currently at risk due to the CMRR-NF project deferral.

TACTICAL PLANNING HORIZON (FY2013-2022)

TA-55: Activities in support of pit manufacturing, surveillance, and certification activities housed at TA-55 include plutonium casting, fabrication, machining, and metallurgy laboratories; plutonium recovery; metal preparation; and destructive analysis and nondestructive analysis laboratories. An SNM storage vault is also located at TA-55. PF-4 (55-0004) and many of the mission dependent (MD) facilities and infrastructure (F&I) at TA-55 will require significant investment to ensure programmatic requirements can be met.

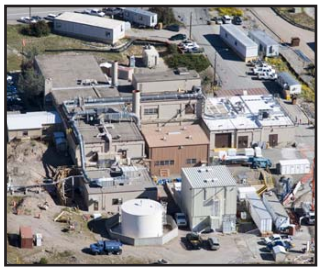
The following projects in the TA-55 area will enable continued operation to meet programmatic requirements:

- *TA-55 Reinvestment Projects:* TRP will revitalize aging, mechanical, safety, facility controls, and other selected systems.
- *Nuclear Materials Safeguards and Security Upgrades Project Phase II:* NMSSUP will upgrade and replace the existing physical security system at TA-55 to address the new protection strategy requirements and deteriorating physical security infrastructure.
- *Radioactive Liquid Waste Treatment Facility Upgrade:* RLWTF will construct a facility to improve the RLW treatment capabilities at TA-50. The facility will provide increased reliability and process capability to meet projected regulatory requirements for discharge.
- *Transuranic Waste Facility:* This project will provide a replacement facility to stage, characterize, and certify newly-generated TRU waste. The Consent Order currently requires that the Laboratory's existing TRU waste processing capability located at TA-54 be closed and remediated by 2015.

Chemistry and Metallurgy Research Facility: The existing CMR (03-0029) at TA-3 serves as the primary facility for a broad spectrum of actinide, metallurgical, and materials properties testing systems of radiological components for Security Category (CAT)-III material levels. The CMR building houses significant nuclear materials capabilities in support of programs at TA-55, including the NSE's premier analytical chemistry capability, metallography, and R&D for science-based stockpile stewardship and surveillance programs.

The CMR facility has been operating on a "run-to-2019" philosophy in anticipation of the Chemistry and Metallurgy Research Replacement (CMRR) project completion. The CMR will be required to operate at some minimal level to sustain capabilities needed for ongoing missions. Until CMRR-NF is certified operational, significant investments in the maintenance of the CMR facility's infrastructure are required to keep the CMR functioning. The Laboratory has initiated efforts to invest in hazard reduction and wing closure which will lead to an operating

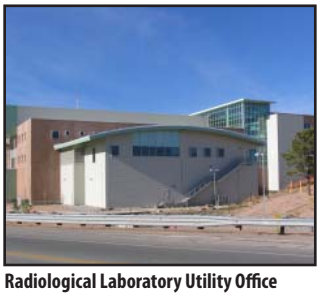
Nuclear Materials Safeguards and Security Upgrades Project (NMSSUP) Phase II



Radioactive Liquid Waste Treatment Facility (RLWTF) Upgrades

Transuranic Waste (TRU) Facility

Chemistry and Metallurgy Research (CMR) Facility



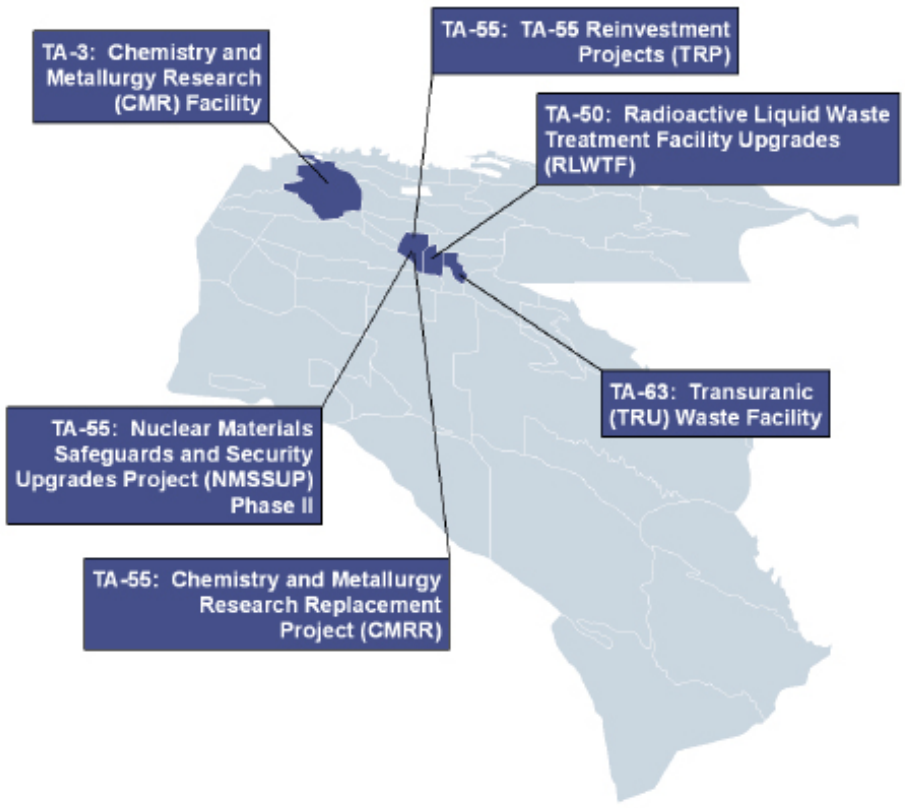
Radiological Laboratory Utility Office Building (RLUOB)

environment that can be sustained until the new CMRR-NF is operational.

The CMRR will provide new facilities at TA-55 to house existing CMR capabilities and consolidate Security CAT-I/II laboratory work in a single area to minimize the transfer of SNM within the NSE. The CMRR project consists of a radiological laboratory/office and utility building (RLUOB) and a security CAT-I/II, Hazard CAT-II nuclear laboratory building (CMRR-NF). Construction of RLUOB was completed in 2011, and radiological operations are planned to commence in FY2014. While substantial final design for the CMRR-NF will be completed in FY2012, the FY2013 President's Budget Request did not include any funding for the project and deferred, by at least 5 years, construction of the facility. Without CMRR-NF, pit manufacturing capacity will likely be limited to less than 20 pits per year. At present time, a number of options are being explored to determine the path forward for this project, including potential programmatic impacts and gaps and possible mitigating actions. Future TYSPs will include any revised project plan.

STRATEGIC PLANNING HORIZON (FY2023-2037)

No significant changes are expected in the future for plutonium mission, programs, and workload currently assigned to the Laboratory. TA-55 is expected to be the NSE's only fully functioning plutonium facility used for R&D and pit manufacturing during the next 25 years. During this period, planning will be initiated on any still to be identified additional PF-4 upgrades/life extension projects. Also during this time period, the CMRR-NF will have been completed, and the CMR will have been decommissioned and excessed.



TRITIUM

Tritium R&D work at the Laboratory is high pressure gas operations in support of enduring nuclear weapons stockpile activities. Tritium work involves a wide variety of pressures, temperatures, materials, equipment, and processes, which makes each operation unique. It is anticipated that the Laboratory will continue current tritium R&D work in support of the stockpile for the foreseeable future.

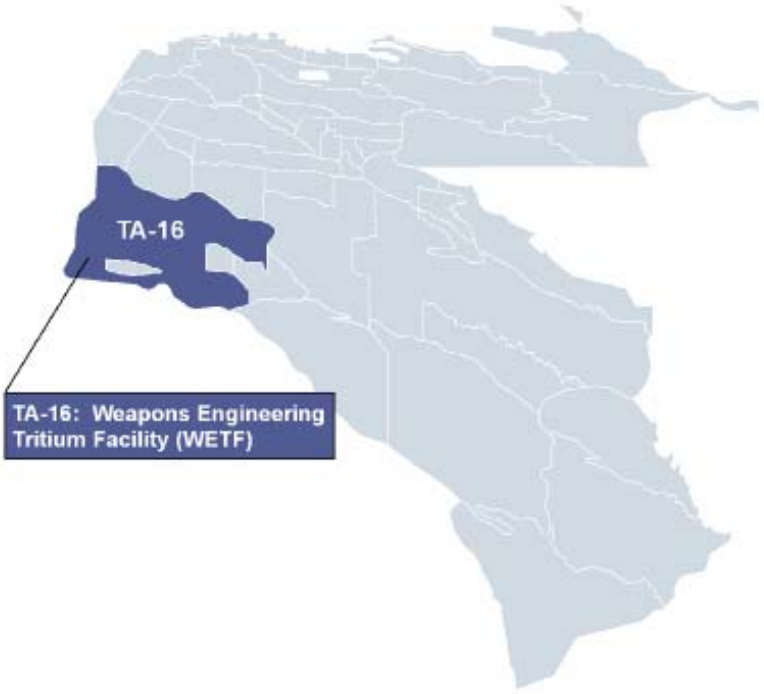
TACTICAL PLANNING HORIZON (FY2013-2022)

Weapons Engineering Tritium Facility: WETF (16-0205) supports a number of unique tritium capabilities not performed anywhere else within the NSE, including research and development on tritium reservoirs, sample mining, reloading of aged R&D units, and plutonium/tritium interaction tests. A rewrite of the WETF Documented Safety Analysis is currently in process, inventory reduction activities are continuing, and a number of small infrastructure projects are currently planned to support sustainable, predictable tritium operations.

STRATEGIC PLANNING HORIZON (FY2023-2037)

No significant changes are expected in the future for tritium mission, programs, and workload currently assigned to the Laboratory. Planning may be initiated on possible upgrades/life extension projects to support mission requirements.

Weapons Engineering Tritium Facility (WETF)



HIGH EXPLOSIVES

The Laboratory's HE capability, which ensures the stability and dependability of HE in nuclear weapons, is essential to maintaining the safety and reliability of the nuclear weapons stockpile. HE R&D supports the improved predictive capability for performance, safety, and aging. This capability is increasingly becoming interwoven into the Laboratory's Global Security missions through shared use of some existing facilities, and transfer of a few weapons program facilities no longer needed.

TACTICAL PLANNING HORIZON (FY2013-2022)

High Explosives Production, Assembly, and Science Facilities Operations: These facilities provide diverse experimental capabilities needed to synthesize, formulate, shape, and machine small-scale HE components as well as the characterization of fundamental materials properties and behavior, small-scale sensitivity, and performance of new, current, and aged HE formulations. A proposed project, the Energetic Materials Characterization Facility, will house energetic material operations and provide capabilities critical to the surveillance, surety, and safety of energetic materials. It will also replace aging and obsolete facilities at TA-9. Another proposed project, the Dynamic Equation of State Facility, will relocate and consolidate gun capabilities from TA-15 and TA-39 to TA-40.

High Explosives Radiography: The TA-8 radiography (08-0023) capability characterizes HE components, and the facility supports the detonator fabrication program, hydrodynamic testing at DARHT, and sub-critical testing at the Nevada National Security Site. The TA-8 radiography facility, over 55 years old and in failing condition, is planned to be consolidated and refurbished to create a safer work environment.

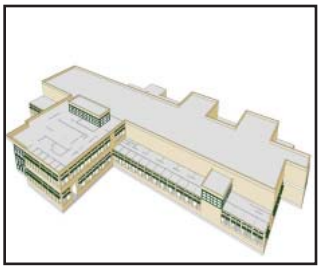
High Explosives Firing Sites: The HE firing sites are used primarily for experimental studies on dynamic properties of various materials under conditions of high pressure and temperature, and tests are conducted as either open air or contained. A modernization and consolidation plan has been developed to reduce the number of open air firing sites while increasing the number of contained firing sites, thus reducing footprint and improving safety and performance.

Nondestructive and Environmental Testing Facilities Operations: These facilities provide the capability for component and subsystem environmental testing, including vibration, shock, temperature evaluation, and radiography in both destructive and nondestructive modes. The environmental testing capability is currently planned to remain at TA-11, and a number of facility and equipment refurbishments are being planned to maintain safe programmatic operations.

High Explosives Detonator Facilities (R&D Production): The HE detonator facilities provide the capability to design, develop, manufacture, and test detonator systems. The facilities also currently provide the capability to produce detonators/initiators for all warheads in the stockpile. The detonator facilities are in good condition, and no related projects are currently planned.

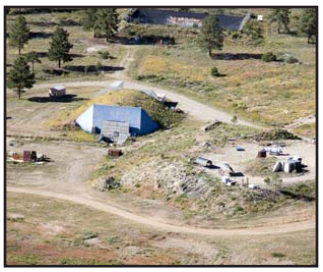
STRATEGIC PLANNING HORIZON (FY2023-2037)

No significant changes are expected in the future for HE missions, programs, and workload currently assigned to the Laboratory. Planning is ongoing for the 25 year time frame to determine what facility reinvestments or new construction will be required to meet mission needs. Other likely projects may include reinvestment to update aging building infrastructure, replace equipment, and upgrade facility systems to ensure continued support of programmatic missions.

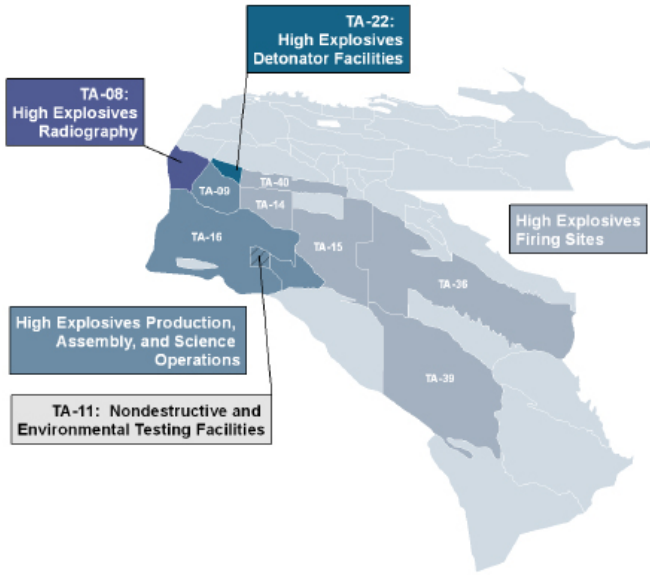


Proposed Energetic Materials Characterization Facility

High Explosive Radiography Facility



High Explosives Firing Sites



NON-NUCLEAR

The Laboratory's non-nuclear component production and testing capability is comprised of a variety of activities, including some that are one-of-a-kind within the NSE.

TACTICAL PLANNING HORIZON (FY2013-2022)

Beryllium Technology Facility: The BTF (03-0141) provides the only technical and classified capability within DOE for non-nuclear beryllium component fabrication and beryllium R&D. Operations at the BTF include alloy development, foundry operations, inspections, nondestructive testing, joining, machining, metallography, mechanical testing, and powder operations. The BTF is currently replacing its facility management system to ensure all building systems continue proper operations. Additionally, an analysis is underway to look at consolidating other classified operations within this relatively modern facility.

Machine Shops: The two machine shops in TA-3 (03-0039 and 03-0102) provide special or unique parts in support of weapons programs, including parts used for testing or replacement within the stockpile. Capabilities include fabrication of specialty components, fabrication using unique materials, and dimensional inspection of fabricated components. The shops are almost 60 years old and a replacement facility, the Weapons Manufacturing Support Facility, is currently planned to house consolidated high precision machining operations. An analysis is underway to look at consolidating operations at another location in the interim.

Sigma: This facility (03-0066) supports a large, multidisciplinary technology base in materials fabrication science. This facility is used mainly for materials synthesis and processing, characterization, fabrication, joining, and coating of metallic and ceramic items. Capabilities provided by the Sigma facility will be required to support increased manufacturing. In the long term, the Sigma facility is a candidate for replacement due to its age and condition. For the near term, however, it provides an important capability for radiological activities that are consistent with the facility and ongoing weapons activities. Options for future replacement or redevelopment to house Sigma's weapons work continue to be considered.

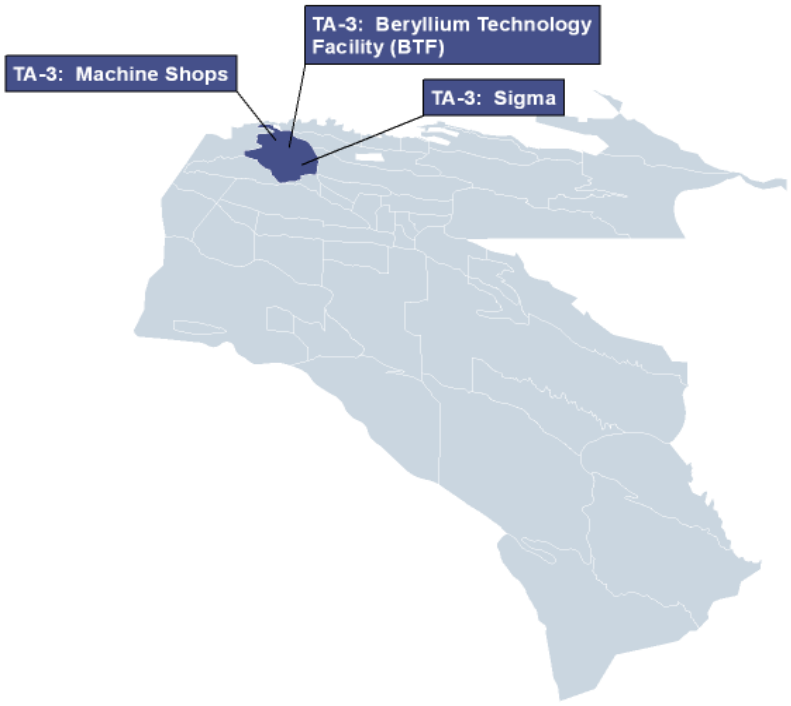
STRATEGIC PLANNING HORIZON (FY2023-2037)

No significant changes are expected in the future for non-nuclear component production/testing missions, programs, and workload currently assigned to the Laboratory. Within the 25 year time frame, planning will be initiated to determine what facility reinvestments or new construction will be required to meet mission needs for facilities without projects planned in the near term.

Beryllium Technology Facility (BTF)

Machine Shops

Sigma Facility



SPECIAL NUCLEAR MATERIAL ACCOUNTABILITY, STORAGE, PROTECTION, HANDLING, AND DISPOSITION

The Laboratory has been identified by NNSA as the nation's consolidated Center of Excellence for plutonium research, development, and manufacturing activities. One key element to performing this mission is the ability to store CAT-I quantities of SNM. This requirement had been met for the last 30 years primarily by the CMR facility and PF-4 at TA-55. In 2001, the CMR facility was de-inventoried and reduced to a CAT-III facility leaving PF-4 as the only facility authorized to store and process significant amounts of SNM.

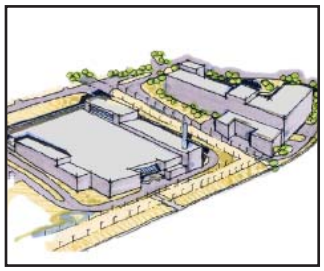
TACTICAL PLANNING HORIZON (FY2013-2022)

PF-4: As programmatic activities associated with pit manufacturing, surveillance, Pu-238 heat sources, and non-proliferation programs are being consolidated to the PF-4 facility, the capacity to meet needs for storage and processing of SNM is being challenged. The main storage vault is presently over 95% full. Focused efforts aimed at processing and discarding materials no longer required for programmatic work, in conjunction with vault and laboratory re-configurations, will help mitigate the escalating space problem for the next decade. The Accelerated Vault Workoff project will increase efforts to process, package, and ship excess material out of the PF-4 vault. While this project will increase the availability of vault space, some material of the floor, for safety and security reasons, would be migrated to the vault. This migration has the potential to occupy some of the liberated vault space.

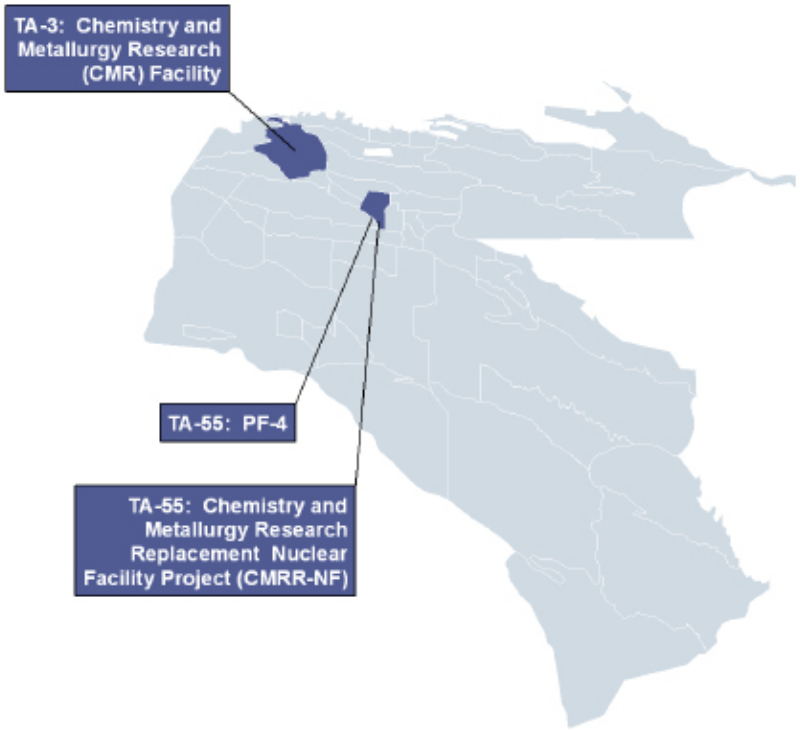
STRATEGIC PLANNING HORIZON (FY2023-2037)

Beyond 2023, it will be necessary to expand the capacity available for the storage and processing of CAT I quantities of SNM or programmatic work will be impacted. It is anticipated that CMRR-NF will be coming on-line in this time frame and will provide the required expansion, including additional vault space and laboratory space for work that is presently performed in the CMR facility. This will help ensure that the required facilities are available to meet the nation's needs for the next 25 years.

Plutonium Facility (PF-4)



Chemistry and Metallurgy Research Replacement Nuclear Facility Project (CMRR-NF)



ENABLING INFRASTRUCTURE

In FY2010, the Laboratory Director initiated an institutional program to reinvest in the Laboratory's aging F&I. The strategy of this program is to identify F&I most essential to Laboratory missions, establish capability gaps (existing and future), and structure a consolidated plan of targeted investment to address the existing gaps and mitigate predicted future gaps in capability. This multi-year program includes prioritized investments in refurbishment and repurposing of existing facilities, consolidation of like work scope into common facilities and centralization of related scope functions, removal of poor facilities from active status, replacement of end-of-life cycle facilities, new construction as appropriate, disposition of excess facilities, and modernization of utilities (Figure 4). Although funding availability for this institutional reinvestment plan will have to be adjusted annually, the prioritized list of F&I needs will ensure that investment of available dollars will go to areas with the highest need. For FY2012, the Director has determined that approximately $22M will be reinvested in this program.

TACTICAL PLANNING HORIZON (FY2013-2022)

Highlights from this institutional program include: design and construction of replacement fire stations necessary for Laboratory operations, targeted facility life extension projects in high capability facilities (such as the Sigma (03-0066) and Radiochemistry Laboratory (48-0001) buildings), removing excess temporary buildings, upgrades to aging utility systems and roads /parking lot improvements.

Refurbishment: Renovation of existing facilities is anticipated to increase and peak at roughly $85M in the 2013-2017 time frame as projects move from design to construction. Laboratory consolidation (59-0001), Health Research Laboratory (43-0001), Otowi building (03-0261), institutional computing (03-0132, -0123, -0200), and a space science laboratory (03-0502) are examples of the planned refurbishments.

Replacement/New Construction: Planned replacement facilities within the next twenty-five years should include radiochemistry replacement laboratories at TA-48, as well as other needed facilities, such as proposed TA-60 facilities to replace the Receiving & Distribution Center (03-0030) and the Crafts/Shops facility (03-0038) relocation. Examples of new construction projects that are being considered or planned include light chemistry and biological laboratories as well as office buildings. The expansion of the TA-48 bioassay laboratory (48-0045) with an additional cleanroom facility (48-0262) and the MSL laboratory build-out are examples of other new construction to address capability needs.

Disposition: The planned elimination of obsolete facilities is a key element in the accomplishment of several complementary infrastructure/business goals, including DM reduction, energy intensity reduction, greenhouse gas (GHG) reduction, workspace environment improvement, targeted maintenance investment in enduring facilities, and reduced risk associated with aged structures. The institutional footprint reduction program is currently targeting $5M annually for excess and disposition of temporary facilities. Although this budget is insufficient for disposition of large permanent facilities, it allows for the excess of permanent structures in the near term. The Laboratory is continuing to seek other funding sources for disposition of currently excessed permanent facilities.

Historical Properties: Associated with World War II and the Cold War, thirty-five historic buildings and structures at the Laboratory are candidates for long-term retention and management. Seventeen properties supported the wartime Manhattan Project and may become part of the proposed Manhattan Project National Historical Park. If the proposed Park legislation becomes law, the Laboratory will prepare a plan for scheduled public access to key historical buildings located within limited access areas.

Otowi Building Life Extension Project

D&D of Temporary Structures

Additional 115kV Transmission Line

Photovoltaic Power Generation

Cogen, TA-3 Steam System Reconfigure

Pre-scheduled escorted bus tours, perimter security fence modifications that create private vehicle pennisulas, Americans with Disablities Act compliant access, and comfort stations are a few of the infrastructures issues that will need to be addressed.

Modernization of Utilities: Within the next ten years utility investments will primarily be balanced among assets needed to meet the Laboratory's expanded supercomputing mission, improve energy efficiency, increase the mix of renewable energy generation, and refurbish aging infrastructure. Some of the investment to provide additional electrical power for the supercomputing mission is expected to be funded by the ASC Campaign.

Major efforts by system are listed below:

Gas—A high pressure gas line extension to the existing combustion turbine is under consideration to enable "black start" capability for the generating unit and reduce the net cost of generation. Additionally, bare steel buried gas mains in TA-3 and TA-16 will be replaced.

Water—The aging water tank interiors will be refurbished in priority order, based on condition assessment reports. Underground water mains will be replaced in the TA-3 campus during the tactical window, as the beginning of a Laboratory-wide water utility assessment and replacement project.

Electric—One of the projects for the enhanced electrical power system will entail re-conductoring the Norton transmission line to increase the Laboratory's import capability to 135 MVA. PNM Resources, Inc. will also need to re-conductor the Reeves transmission line or construct a third 115 kV line to Los Alamos to raise the import capability above 200 MVA. Negotiations are underway on cost allocation on the PNM assets.

A replacement substation at TA-3 is planned to begin construction in FY2014, while upgrades to the distribution system will provide substation backup and allow for future growth. These upgrades will consist of new underground feeders between the five substations, which will be sized to carry substantial loads; will continue into the Strategic time frame; and is related to future growth across the site.

Other electric utility projects include upgrading the controls for the Static Var Compensator and replacement of 15 kV switchgear at TA-55. Additional photovoltaic power generation at the TA-61 landfill is being considered within this decade but will likely be solicited by Los Alamos County through a power purchase agreement rather than NNSA capital investment.

Wastewater—The Sanitary Effluent Reclamation Facility (SERF) expansion project will reduce the Laboratory's potable water usage and ensure compliance with the National Pollutant Discharge Elimination System permit. As part of this project, SERF (03-1398) will be expanded to process wastewater from the Sanitary Wastewater System, Metropolis Building cooling towers, and the power plant for reuse at these facilities and potentially at additional Laboratory cooling towers. Discharge to several outfalls will be minimized or eliminated as a result of this project. Lift stations, manholes, and sewer mains will be replaced at TA-3 during the tactical window as the beginning of the Laboratory-wide water utility assessment and replacement project.

Cogen, Steam—Initial phases of the cogeneration plant and heating system replacement are planned to enable retirement of the existing steam plant by 2025. This includes the addition of a heat-recovery steam generator to the existing gas turbine and replacing the TA-3 campus steam system with a more life-cycle cost-effective hot water system.

Roads—The Omega Bridge will undergo a life extension renovation, primarily on the traffic deck. Portions of Diamond Drive from Embudo to Pajarito will be rebuilt. Parking, roadway, and pedestrian access will be improved along the Pecos Road corridor, in order to safely accommodate the increasing vehicle and foot traffic for TAs -55, -50, and -35.

STRATEGIC PLANNING HORIZON (FY2023-2037)

Modernization of Utilities:

Gas, Water, and Wastewater—Continuation of the lab-wide replacements for water, gas, and wastewater buried piping and other major equipment will occur in the 11-25 year time frame.

Electric—Electric utility planning will continue to define the projects to build distribution substation ties, upgrade substations including transformers, and provide infrastructure to support future growth, mainly in the Strategic Computing, LANSCE, and TA-55 mission areas.

Cogen, Steam—Continuation of the cogen plant and heating system replacements will extend into the Strategic window, including a new steam turbine generator. Evaluation and implementation of a central chilled water utility serving the computer centers and NSSB is also under consideration.

Roads—The Omega Bridge will continue to receive life-extension refurbishments in the 11-25 year time frame with the intent of deferring its replacement. The strategic window includes major work on all primary roadways, the most notable being the widening of the truck route.

COUNTERTERRORISM & COUNTERPROLIFERATION

As part of the Laboratory's national security programs, this core capability is designed to provide end-to-end mission support to the NNSA Office of Defense Nuclear Nonproliferation (NA-20), the Office of Emergency Operations (NA-40), and the Office of Counterterrorism and Counterproliferation (NA-80). The mission is to prevent the proliferation of nuclear weapons, strengthen global nuclear security, ensure response capabilities and support arms control and disarmament treaty verification.

Activities within this core capability include:

- nonproliferation
- nuclear forensics
- nuclear CT
- emergency response
- intelligence analysis
- treaty verification

DOE and NNSA national security programs, occupying facilities across the Laboratory, are designed to:

- detect, secure, and dispose of dangerous nuclear and radiological material, as well as developing technology and expertise to reduce the nuclear threat
- provide technology development and support policy and decision making in the areas of space science, space-based nuclear detonation detection, and national security space missions
- meet national needs to dispose of excess weapons-grade plutonium and repurpose plutonium stockpiles for peaceful and non-weapons purposes
- develop and integrate CT and CP solutions relevant to end-users working in tactical operations
- provide personnel, equipment, training, facilities, and communication to respond to worldwide nuclear and radiological events
- support DOE Office of Intelligence (IN) through direct intelligence analysis, intelligence related research and development, and intelligence operations support

TACTICAL PLANNING HORIZON (FY2013-2022)

Within this decade, consolidation and co-location of functions is essential to sustain and grow CT/CP capabilities. The proposed Nuclear Counter-Proliferation/Terrorism facility, uniquely devoted to understanding and defeating nuclear proliferation and terrorism—one of the top priorities within the U.S. nuclear agenda, will consolidate functions and modernize the infrastructure for this capability.

Counter and Nonproliferation: This Laboratory core capability plays a vital role in achieving the nation's nuclear counter and nonproliferation agenda by applying technical acumen, access to nuclear materials, international field experience, and knowledge of weapons systems. In accelerating the efforts to implement President Obama's initiative to secure all vulnerable nuclear materials worldwide in four years, the nuclear nonproliferation core capability anticipates additional computing space, radiological laboratory space, and development and training areas will be needed. Within this tactical time frame, projects being investigated to sustain this core capability include (1 expanding the low enriched uranium processing at Sigma, (2) molybdenum-99 isotope production at the proposed LANSCE Material Test Station, (3) a new or revitalized facility for the International Atomic Energy Agency training schoolhouse possibly co-located with emergency response training facilities, and (4) an Applied Nuclear Experiment Facility located at TA-55.

Space Systems: This program provides science-based space solutions, engages the national debate on space issues with sound technical input, and diversifies the space-systems product line to enable a broader national security impact. Within the next few years, the trailer mounted portable

Proposed Space Systems Data and Operations Center

Cold War Era Physics Building (TA-03-0040)

Aging/Obsolete Facility at Fenton Hill

Cold War Era Radiological Laboratory Building at TA-35

Proposed Space Systems Instrumentation Building

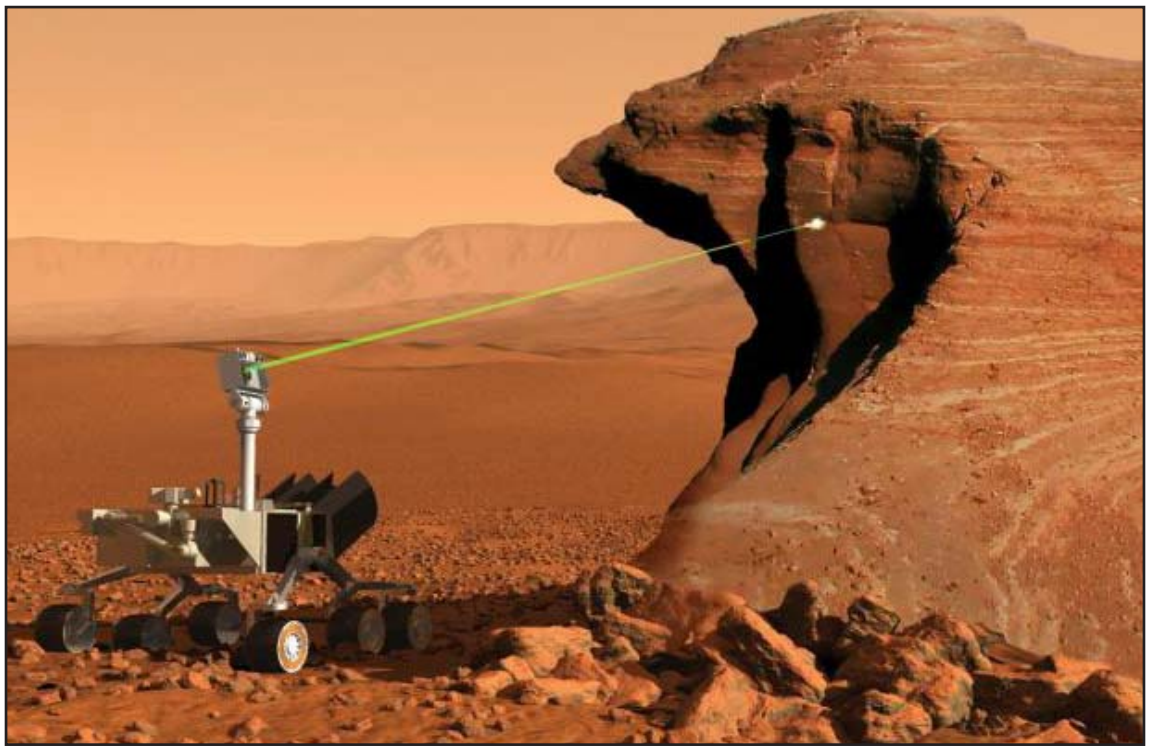
pulser located south of the Physics building (03-0040) may be moved to a more appropriate location at TA-33 and concomitantly provide a TA-3 location for a general plant project (GPP)-sized facility needed for a Space Systems Data and Operations Center. This growing program currently occupies space in the Physics building, which is scheduled for replacement within the next decade. Additionally, a small modular communications/operations facility will be needed at Fenton Hill to replace the existing buildings used for this program.

Non-weapons Plutonium Activities: This effort focuses on the utilization of the consolidated Center of Excellence for plutonium research, development, and manufacturing for non-weapons activities. Near term efforts are focused on two areas: 1) providing the process and manufacturing development expertise to prototype the NSE's weapons-grade plutonium disposition needs, including the manufacture of mixed oxide fuel, and 2) continue to produce heat sources for national missions including the space program. These efforts, in addition to supporting national non-proliferation activities, also serve as a key means to diversify the activities performed at TA-55 and provide additional funding sources to maintain critical capabilities. Facility adjustments and operation modifications may require consideration to meet potential expanded or accelerated manufacturing requirements.

Emergency Response (NA-40): The scope of this program is to provide personnel, equipment, training, facilities, and communication to respond to worldwide nuclear and radiological events at all times. New or repurposed space is needed for planning, training, practice, and response. Conference rooms, sensitive compartmented information facility (SCIF) space, and flexible training areas will be provided in the proposed NCP/T facility.

STRATEGIC PLANNING HORIZON (2023-2037)

Early in the next decade, a new non-proliferation radiological laboratory, training, and office building capable of handling CAT-III/IV SNM will be needed to replace obsolete Cold War Era radiological laboratory buildings at TA-35. During this time period, a Space Systems Instrumentation Line Item building will be necessary to replace many of the activities currently conducted in the Physics building. This facility will increase the capacity for research and development, design, fabrication, calibration, and testing of space instrumentation.



Above: Artist's rendering of the Curosity rover containing the Laboratory's ChemCham, an instrument developed in collaboration wih the Jet Propulsion Laboratory and the Institute de Recherche en Astrophysique et Planetologie, France. ChemCam is comprised of two instruments: (1) a remote micro-imager high-resolution pictures and (2) laser-induced breakdown spectroscopy (LIBS) equipment for chemically analyzing rocks and soil.

SUPPORT OF OTHER MISSION / PROGRAM CAPABILITY (WORK FOR OTHERS)

The Laboratory's Global Security programs work with private entities and other government agencies such as the Department of State, Department of Defense (DoD), Department of Homeland Security, the U. S. Intelligence Community, and foreign partners. The Laboratory contributes to these non-NNSA entities on multiple fronts including: development of science and technologies that support CT and CP, nuclear threat response, warfighter programs, energy security efforts, emerging threats, and one-of-a-kind analysis to ensure a safe and secure nation. These efforts contribute directly to national strategies and international initiatives to help ensure global stability.

Activities within this core capability include:

- warfighter support
- intelligence support
- energy system development and analysis
- complex system modeling and analysis
- cyber security
- technology exploitation
- climate and natural system modeling and analysis
- health threats

These activities are dispersed throughout the Laboratory, many in buildings that are up to 60 years old. Reinvestment and replacement of these facilities will create a modern and efficient workplace. Programs within this core capability are designed to:

- understand, detect, and respond to emerging national security threats, including threat analysis, detection, and technologies to respond to nuclear and radiological, biological and chemical, and explosives
- research, develop, and apply unique technologies supporting the warfighter and DoD missions
- service national needs to understand and improve infrastructure resilience, stability, security, and reliability to prevent calamity and avoid crises while ensuring global economic, political, and social stability

TACTICAL PLANNING HORIZON (FY2013-2022)

Warfighter Support: This program provides high-leverage, game-changing technology to the American warfighter. This quickly expanding program needs additional and modern laboratory, office, and SCIF space, which could be provided in the proposed NCP/T facility.

Homeland Security: This program contains respected experts and research and development capabilities on Weapons of Mass Effect (WME) threats; contributes to global architectures for identifying, detecting and defeating WME threats; and provides vital technologies and options for responding to and mitigating WME events. This quickly expanding program needs additional laboratory, office, shop space, and secure computing and SCIF space proposed in the NCP/T facility.

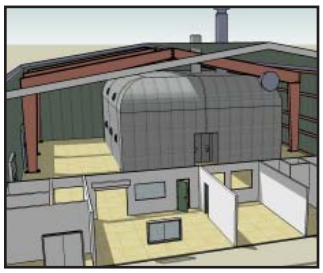
Special Support for DoD: This program is one of the DoD's special operations community's preferred provider for rapid response CT applications in the areas of tagging, tracking, and locating; reconnaissance and surveillance; command, control, and communication; energetic materials; and a significant contributor to the NNSA-lab nuclear CP team. As another growth area, immediate reinvestment is needed in some buildings housing existing SCIF space, as well as the addition of high performance computing (HPC) facilities. Firing site activities require additional facility space to support a mix of energetic materials activities. Also, large-scale energetic materials testing is being considered at DARHT and other existing firing sites.

Intelligence Analysis, Integration, and Exploitation DOE-IN: This program area solves critical and challenging technical intelligence

Proposed Nuclear Counter-Proliferation and Counter-Terrorism Facility

Proposed Center for Energetic Research Development and Applications (CERDA)

Proposed Additional Compartmented Information Facility (SCIF) Space



Proposed Contained Firing Facility

Aging/Obsolete Laboratory at TA-35-0002

and cyber problems. Reinvestment in existing facilities and construction of new SCIF office and lab space will promote and accommodate the need for expanded HPC capability in a secure cyber environment. Ancillary cooling and power upgrades will be required to support new HPC systems. The NCP/T facility would include this capability. Remote R&D areas will need small maintenance and operation facilities.

Energy and Resilient Infrastructures: This effort focuses on providing infrastructure-related analytic development and operations capability centers for major branches of government and utilizes capability knowledge and expertise to provide forward thinking infrastructure solutions. These capabilities occupy space in several TA-16 facilities first developed for the nuclear weapons programs during the Cold War. The near term plan for accommodating future expansion for this product line is to utilize existing facilities and capabilities throughout several organizations and areas at the Laboratory (i.e. increased space utilization). This approach may need to be augmented with additional HPC and TA-3 facility space to meet the work-for-others energy security program demands.

STRATEGIC PLANNING HORIZON (FY2023-2037)

The following decade will still require replacement of end-of-life-cycle facilities supporting this capability, including a Stand-off Active Interrogation Field Site and Proton Interrogation Facility at LANSCE and additional laboratories.

Above: The Laboratory's unique computer and modeling resources are used for predictive and situational awareness modeling, which when coupled with a strong intelligence analysis capability, enables Los Alamos to identify and quantify possible Weapons of Mass Effect (WME) threats and develop solutions for detection and interdiction.

OTHER CAPABILITIES (SCIENCE AND ENVIRONMENTAL PROGRAMS)

SCIENCE PROGRAMS

The Laboratory operates many science and engineering facilities vital to national security as well as to science missions. LANSCE, for example, supports NNSA as a MC facility. It is also the Laboratory's top experimental science facility priority that supports the Office of Science (SC) as a national user facility for materials research as well as medical isotope production, and the Office of Nuclear Energy (NE) with nuclear energy-related research. Additionally, the Laboratory manages components of the National Science Foundation sponsored National High Magnetic Field Laboratory (NHMFL) (35-0124), the SC-sponsored Center for Integrated Nanotechnologies (CINT) (03-1420), and the Stable Isotope Resource (35-0085). LANSCE, NHMFL, and CINT are major national scientific user facilities, supporting over 1,000 visits annually from qualified members of the national and international science and engineering community.

Los Alamos Neutron Science Center Non-NNSA Missions: LANSCE will remain an important facility for non-NNSA missions in addition to its important NNSA role, with funding for accelerator operations supported through RTBF. The facility also supports two notable technical facilities—the Lujan Center for Neutron Scattering, principally supported by Office of Science, and the Isotope Production Facility (53-0984) formerly supported by NE and now also under SC. The Isotope Production Facility is integrated into the DOE Isotope Program and serves the nation by providing materials, know-how, and data that meet the most important existing, emerging, and future needs for accelerator-produced radioisotopes used for medical therapy and diagnostics, national security, and nuclear physics applications. The Laboratory anticipates additional evolution of SC and NE activities at LANSCE with completion of LINAC RM, including new and enhanced instrumentation within the Center to complement future operation of the Spallation Neutron Source at Oak Ridge National Laboratory. In a separate development, future expansion of NE activities is anticipated through the implementation of a Materials Test Station that uses the high-power LANSCE beam to help test potential advanced fuels and materials. Planning to accommodate the Materials Test Station work at LANSCE is ongoing.

Matter-Radiation Interactions In Extremes: As discussed relative to NNSA mission needs under the Design, Certification, Testing, Experiments, Surveillance and ST&E Base Core Capability, the Laboratory is pursuing the signature facility concept MaRIE for achieving and maintaining leadership in materials-centric national security science. MaRIE's focus is on achieving solutions for transformational materials performance with an emphasis on matter-radiation interactions in extremes. Those solutions, enabled by MaRIE, will provide unique capabilities to address many national and global security challenges. MaRIE will be an international user facility and add to the suite of national user facilities provided through the Lujan Center, NHMFL, and CINT.

To support the Laboratory vision as the premier national security science laboratory, modernization of aging facilities and consolidation of the laboratory footprint to a sustainable size and configuration is required. The Sustainable Science, Technology, and Innovation (SUSTAIN) project will provide new modern state-of-the-art facilities to support critical NNSA and mission-related scientific efforts for the next 25 to 50 years. The Laboratory needs to replace aging infrastructure with modern, safe and secure infrastructure that supports the recruitment and retention of premier scientists, consolidates and reduces the Laboratory's facility footprint, and reduces the operating and maintenance costs. Acquisition of this facility will utilize both traditional design-bid-build and design-build strategies using firm-fixed price subcontracts.

Center for Integrated Nanotechnologies (CINT)

National High Magnetic Field Laboratory (NHMFL)

D&D of TA-21 (DP East, West, and the Tritium Systems Test Assembly Facility)

Material Disposal Area B (MDA-B)

TA-54 Closure and Disposition of Legacy Transuranic Waste

In addition, the Laboratory's Biological Sciences Laboratory facility (03-1076) will provide foundational capability for biosecurity R&D, extending the scope of laboratory work to pathogens of significant national security concern. Facility startup will be conducted in FY2013.

ENVIRONMENTAL PROGRAMS

The DOE Office of Environmental Management (EM) funds the EM Program at the Laboratory, and the NNSA Los Alamos Site Office provides direction to the Laboratory EM Program for characterizing and remediating contaminants in the environment, decontaminating and decommissioning facilities, and managing and disposing of hazardous, mixed, low-level, and TRU waste. On March 1, 2005, DOE, the University of California, and the NMED signed a Compliance Order on Consent (the Consent Order) that established requirements and schedules for investigation and cleanup of contaminated legacy sites. On June 1, 2006, LANS assumed the responsibility as the management and operating (M&O) Contractor. All required post remedy monitoring and maintenance activities are planned to be transitioned from the EM Program to the site landlord, NNSA, through the Long-Term Environmental Stewardship (LTS) Program.

AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009

The Laboratory received $212 million for environmental cleanup projects as part of the 2009 American Recovery and Reinvestment Act. The Laboratory's EM Recovery Act projects, which include both Consent Order and non-Consent Order projects, included the disposition of DP East, West, and the Tritium Systems Test Assembly facility in 2010; the installation of 16 regional intermediate monitoring wells and 2 alluvial wells and plugging and abandoning six existing Laboratory wells; and the removal and disposition of waste in MDA B and restoration of the six-acre site to a residential cleanup standard. The MDA B remediation project involved excavation of approximately 39,922 cubic yards of waste (low-level waste, mixed waste, industrial waste) as well as packaging, shipping, and permanent disposal of the waste. The project was completed and the final report submitted to meet the NMED regulatory milestone of September 30, 2011.

CONSENT ORDER AND OTHER ENVIRONMENTAL MANAGEMENT PROJECTS

Ongoing projects include:

Soil and Water Remediation: These efforts include all investigation, remediation, regulatory and public interfacing, and associated work related to solid waste management units, MDAs, areas of concern, and the affected ground and surface waters at the Laboratory. The scope is for investigation and cleanup (if needed) of the approximately 800 solid waste management units and areas of concern remaining from the original 2,129 sites spread over the Laboratory. These sites include canyon bottoms septic tanks and lines, chemical storage areas, wastewater outfalls, landfills, incinerators, firing ranges, surface spills, and electric transformer storage areas. Project activities are conducted in accordance with the Consent Order as well as applicable environmental laws, regulations, and end-state objectives.

Disposition of Legacy TRU Waste: Some sites being remediated under the Consent Order also contain stored (above and below ground) legacy radioactive wastes. This waste is packaged, inspected, and loaded for shipping at TA-54. Approximately 5,000 cubic meters of above-ground and 2,400 cubic meters of below-ground waste must be dispositioned and sent to the WIPP prior to closure of disposal sites at TA-54. Closure of TA-54 will involve demolition of nearly 280,000 sq. ft. of facilities and remediation of disposal areas per the Consent Order. The current, recommended remedy is installation of an evapotranspiration cover over the disposal areas and soil vapor extraction (SVE).

POST CONSENT ORDER ACTIVITIES

Once the Laboratory's cleanup actions are at a level appropriate for land use designations, support mission needs, and compliant with all applicable laws and regulations, the scope of LTS efforts will begin. These efforts, aligned with the Laboratory's 50-Year Environmental Stewardship Plan, are tied to DOE's LTS Guidance and will include scope such as continuity of data and information management, environmental sampling, and maintenance of engineered barriers/remedies. Additionally, facilities for newly-generated waste will replace those decommissioned at TA-54.

6.0 REAL PROPERTY ASSET MANAGEMENT

SITE FOOTPRINT

The Laboratory footprint at the beginning of FY2012 was slightly over 8.5 million gross square feet (gsf) with 1,104 buildings. The total includes 827 (7,758k gsf) permanent facilities, 231 (370k gsf) trailers and transportables, and 46 (446k gsf) leased facilities. The Laboratory footprint has gradually been reduced in recent years through ongoing footprint reduction efforts funded by several programs. At the same time, construction of new facilities has addressed new and ongoing program requirements. These efforts have helped address facility age and sustainability concerns as they relate to programmatic risk. However, approximately 40% of the remaining permanent structures are more than 50 years old and 80% of the remaining trailers/transportable are over 20 years old, emphasizing the need for continued construction and disposition investment in order to achieve an appropriately sized, energy efficient, sustainable footprint consistent with mission requirements.

FY2011 represented the tenth year of the congressional one-for-one footprint reduction mandate and RTBF key milestone. During this time period, the Laboratory eliminated almost 1.4 million gsf, while adding slightly over 0.7 million gsf through new construction. The delta was "banked" in accordance with DOE/NNSA requirements. This level of success provides the basis for continued removal over the next five years of additional shutdown/excessed structures no longer required for mission work.

SHORT TERM (FY2013-2017)

Ongoing work in FY2012 is anticipated to remove approximately 80k gsf. During the FY2013 – FY2017 timeframe, the Laboratory anticipates removal of over 250k gsf with currently identified funding sources, primarily EM and Institutional funding. The multiyear Facility Disposition Program (FDP) is being proposed for initial NNSA funding beginning in FY2014. The FDP is anticipated to be the key funding source for addressing disposition at the Laboratory for a significant number of currently shutdown/excessed facilities as well as other structures anticipated for shutdown in the coming years. The Laboratory is working with NNSA and other sites in developing an executable program with alternative funding levels. The Laboratory has proposed approximately 500k gsf for FDP funded disposition during this timeframe.

NEAR TERM (FY2018-2022)

The perspective for the ten-year horizon, including the previously discussed five year horizon, is the need to remove more than 800k gsf across the institution (Figure 4). An implication equally important to square footage removal is the minimization of activities and removal of most structures at five TAs -18, -21, -41, -43, and -54. Elimination of most existing trailers and transportables across the institution is also a goal during this timeframe. Footprint reduction over the next ten years will continue to be a basic business strategy that accomplishes more than reducing operating costs and surveillance and maintenance (S&M) costs. It also:

- minimizes risk associated with deteriorating facilities
- contributes to all site and national goals associated with reductions in water and energy use, GHG and carbon footprint reduction, as well as the avoidance of DM
- addresses waste disposal as soon as possible, thereby avoiding the continued escalation costs associated with removal
- creates available land for future programmatic activities

For an enduring site such as Los Alamos, removal of obsolete structures as soon as possible following completion of the shutdown/excessing processes is the best approach for reducing cost, minimizing risk, and maximizing program opportunities. Over time, all enduring sites will have structures that reach the end of their viable lifetimes and need to be removed. A national program, such as the proposed FDP, to quickly address the elimination of obsolete structures before a significant backlog is realized would provide a practical and efficient infrastructure means to address this issue.

LONG TERM (FY2023-2037)

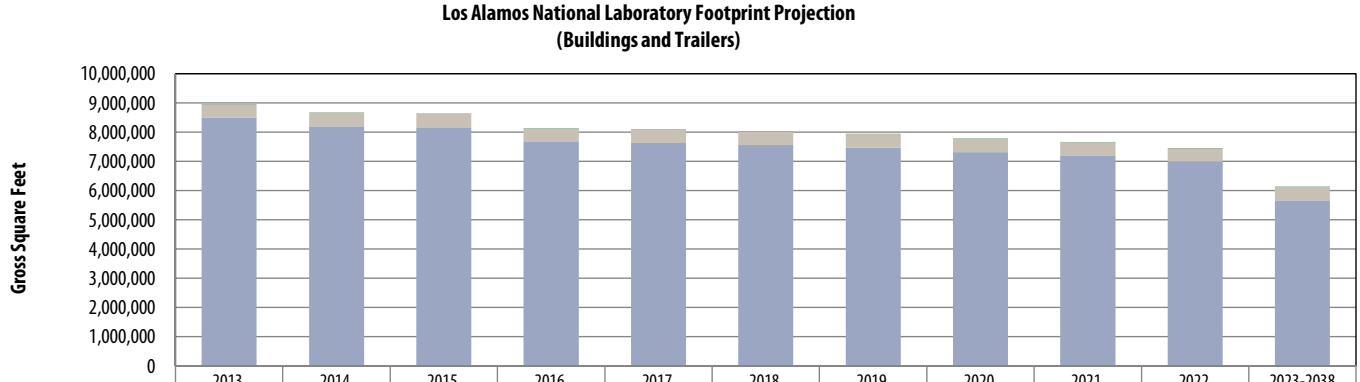
The following fifteen-year horizon will provide continued challenges for replacement and removal of major structures that will have been in service for 70 years or more. The highest profile project will be the removal of the CMR facility. This nuclear facility was constructed in 1953 and consists of approximately 570k gsf within the most populated TA of the Laboratory. At present time, deferral of the CMRR-NF project may delay removal of the existing CMR, but it is anticipated that demolition will occur by 2037. A number of other major MD non-nuclear research facilities will be in a similar situation, requiring investment for life extension, replacement, and eventual removal. These facilities, constructed in the early 1950s, include the Crafts/Shops facility (115k gsf, constructed in 1952), and the Tech Shop (154k gsf, constructed in 1954). Institutional facilities, such as the Physics building (187k gsf, constructed in

1953) and the Receiving & Distribution Center (115k gsf, constructed in 1952) present numerous challenges that are driving replacement strategies as early as possible within the twenty-five year timeframe. In total, these five structures amount to a reduction of more than 1.1M gsf.

LEASE ARRANGEMENTS

The current level of leased space is viewed as a practical, flexible, and cost effective approach for accommodating over 1,500 staff consistent with mission requirements at the Laboratory (excluding subcontract personnel who are not part of the Laboratory workforce). In the absence of major mission shifts affecting the overall workforce, there are no major changes anticipated with the aggregate quantity of leased space. However, the Laboratory is currently considering lease space options for securing flexible swing space for researchers during refurbishment projects that affect their laboratory space. Recognizing that each lease has specific attributes, cost, and term, the associated effectiveness in meeting functional requirements is continually verified for contract conformance followed by the opportunity to conclude or renegotiate the lease when appropriate. At this time, there are no budgeted plans to shift the current workforce from leased space to owned facilities on the Laboratory site (Figure 4). All contractor leases are managed by the Laboratory and are included in the Facilities Information Management System (FIMS) database.

Approximately 100 acres and one facility are leased by others from DOE at the site. These leases support research facilities and community needs, such as the Los Alamos County Eco Station (LACES) (a solid waste transfer and recycle facility, formerly a landfill), communication towers, and construction support. The recent FY2012 long-term lease of 54 acres at the LACES to the County of Los Alamos permits the construction and operation of a 2 Mw solar photovoltaic field. This use will assist the Laboratory to meet its Executive Order 13423 requirements for renewable energy and will be a demonstration of new technologies.



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023-2038
Outgranted	4,558	4,558	4,558	4,558	4,558	4,558	4,558	4,558	4,558	4,558	4,558
Contractor Leased	465,600	465,600	465,600	465,600	465,600	465,600	465,600	465,600	465,600	465,600	465,600
DOE/NNSA Leased	-	-	-	-	-	-	-	-	-	-	-
DOE/NNSA Owned	8,484,601	8,202,870	8,167,897	7,657,639	7,622,536	7,553,306	7,463,672	7,308,514	7,187,899	6,982,681	5,664,904

Figure 4: Los Alamos National Laboratory Footprint Projection (Buildings and Trailers)

FACILITY CONDITION

The current condition of MC facilities, reflected in Attachment F, is "Good" with a facility condition index (FCI) of 2.1% (Figure 5). The condition of the MC facilities has remained fairly constant over the past seven years (Figure 6), consistent with the RTBF milestone to achieve FCI at less than 5% by 2017. MC FCI is predicted to gradually increase through the tactical planning horizon of this TYSP due to the sunset of FIRP and lack of sufficient funds for a sustainable maintenance program. Planned DM buy-down activities, coupled with construction of RLUOB, are predicted to keep the FCI for MC facilities rated "Good".

The current aggregate FCI for MD facilities is 11.1%, and is predicted to be 10.1% in FY2012. This relatively flat trend will continue through the tactical and strategic planning horizons. The FCI for MD facilities is predicted to increase during the strategic horizon. It is anticipated that FCI for MD facilities will not achieve the RTBF milestone of FCI below 8% by 2015, but future consolidation, reinvestment, and new construction will prevent further significant increases in MD FCI.

The condition of NMD facilities has improved to "adequate" with an FCI of 12.5%. This trend is expected to

Replacement Plant Value (RPV)[5]				$12,413	Million	
Total Deferred Maintenance (DM)[6]				$976	Million	
Site Wide Facility Condition Index (FCI)[6]				7.9%		
		Facility Condition Index (FCI)[6]	Asset Condition Index (ACI)[6]	Asset Utilization Index (AUI)[7]	# of Assets[5]	Gross Square Feet (GSF) Buildings & Trailers (000s)
Mission Dependency	Mission Critical	2.1%	97.9%	98.9%	31	2,062
	Mission Dependent	11.1%	88.9%	99.6%	305	1,488
	Not Mission Dependent	12.5%	87.5%	99.1%	768	5,025
Facility Use	Office	8.6%	91.4%	99.5%	299	2,411
	Laboratory	5.1%	94.9%	97.3%	201	3,180
	Warehouse	13.9%	86.1%	99.7%	253	667
	Medical	0.0%	100.0%	100.0%	1	21
	All other Categories	10.2%	89.8%	98.9%	350	2,296

Figure 5: Los Alamos National Laboratory Real Property Asset Management per End of FY2011 FIMS Reporting

remain relatively flat throughout the tactical and strategic planning horizons. This calculated improvement is due mainly to the removal of excessed deteriorating buildings thereby avoiding DM, and the reinvestment in targeted facilities. Continued reinvestment in targeted facilities will improve the condition as long as funds are available. Consolidation planning and footprint reduction will continue to improve DM in NMD facilities. Planned footprint reduction, mission consolidation efforts, and programs such as CBFI will provide for allocation of funding for recapitalization of real property assets, but will need to be accelerated to out-pace aging and degradation of the facilities.

The Laboratory continues to place emphasis on its condition assessment survey program, with 1.6M gsf of Laboratory space to be inspected this fiscal year.

DEFERRED MAINTENANCE REDUCTION

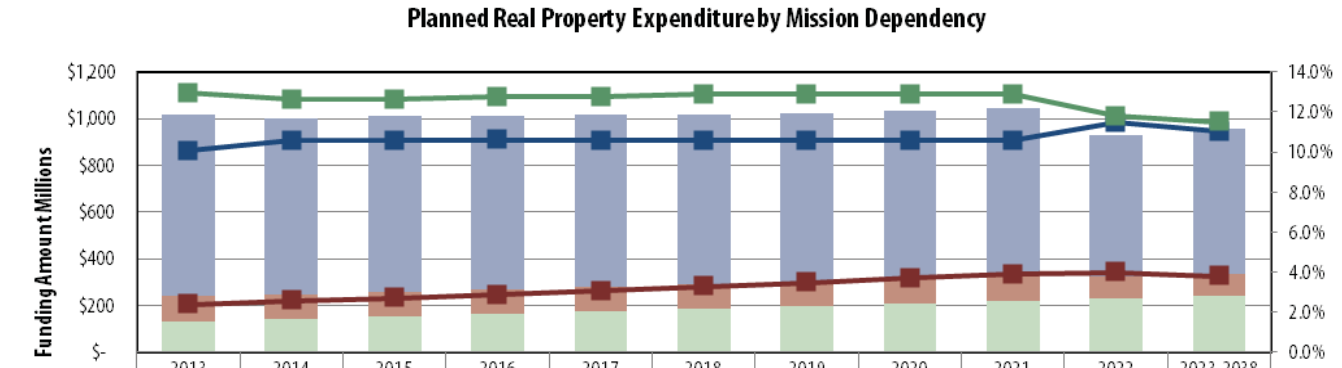
Flat RTBF budgets have resulted in lower amounts of available funding for real property maintenance in MC and MD facilities. Current and out year budgets may not be adequate to support the level of preventive and corrective maintenance required to avoid the growth of DM. Institutional focus on the reliability of facility safety systems, such as pressure safety, electrical power systems, and fire protection will also leave shortfalls in maintenance funding. Cessation of FIRP will also contribute to DM growth. However, the Laboratory is hopeful the CBFI initiative will mature into a viable, supported program.

The DM reduction goals require that the Laboratory make increased investments in real property maintenance over the next several years. Funding will likely not be available for increases in maintenance, but the Laboratory will continue efforts to fund investments, through Facility and Infrastructure Transformation (FIT) projects, with a goal of decreasing DM on MC facilities. FIT projects will be funded based on their ability to achieve longer-term cost savings and increased operational efficiencies, result in either consolidation of operations or decommissioning/decontamination of existing facilities, or support unique, specific enhancements or upgrades to a facility that would not be ordinarily funded but that are reasonably expected to enhance programmatic efficiency or reduce risk.

Another strategy to reduce maintenance funding gaps will be to significantly reduce maintenance needs through footprint reduction and increased productivity. With the required maintenance of shutdown facilities reduced to a surveillance level, remaining maintenance funds can be applied to facilities with high priority maintenance needs, thus preventing the growth of new DM.

Any reduction in funding (e.g., new budget authority, delays in construction project activities, or shortfalls in cost recovery funding), puts the availability of Laboratory facilities at risk. The Laboratory ensures the safety, security and compliance of its facilities as a number one priority, but funding reductions may lead to decisions that put availability and completion of mission activities at risk.

5. DOE owned real property and leased facilities
6. DOE owned real property (buildings, trailers, other structures)
7. DOE owned and operated gsf



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023-2038
DM NMD	$780	$756	$756	$743	$735	$723	$718	$719	$720	$609	$620
DM MD	$108	$107	$107	$107	$107	$106	$106	$106	$106	$90	$95
DM MC	$130	$140	$151	$163	$174	$186	$197	$208	$220	$232	$240
FCI MC	2.4%	2.6%	2.7%	2.9%	3.1%	3.3%	3.5%	3.7%	3.9%	4.0%	3.8%
FCI MD	10.1%	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%	11.5%	11.0%
FCI NMD	13.0%	12.6%	12.6%	12.7%	12.7%	12.9%	12.9%	12.9%	12.9%	11.8%	11.5%

Figure 6: Los Alamos National Laboratory Planned Real Property Expenditure by Mission Dependency [8].

SPACE UTILIZATION AND CONSOLIDATION

Improving space utilization is a part of the strategic goal to be accomplished through footprint reduction. The process for utilization improvements is integrated into the consolidation process for footprint reduction. Institutional space standards were updated in 2010 based upon benchmarking performed by the International Facility Managers Association for governmental and educational office space utilization. Continued application of the new space standards, coupled with consolidation and footprint reduction efforts, will enable the Laboratory to continue to improve utilization rates into the future.

SUSTAINABILITY/ENERGY

The Laboratory prepared the FY2012 Site Sustainability Plan to meet the goals established in DOE Order 436.1 Departmental Sustainability. The Laboratory uses its ISO 14001:2004 certified Environmental Management System (EMS) to establish objectives to improve compliance, reduce environmental impacts, increase operational capacity, and meet long term sustainability goals. The goals of the FY2012 Site Sustainability Plan are fully integrated into the Laboratory's institutional environmental objectives under the EMS.

The Laboratory is depending on the success of a number of projects, including the Energy Savings Performance Contract, SERF expansion, High Performance Sustainable Building implementation, lighting retrofits, heating, ventilation, and air-conditioning re-commissioning, building night set-back scheduling, and the associated footprint reduction efforts to achieve the energy and water goals and reduce GHG emissions.

The Laboratory's recent sustainability successes include a leadership structure that supports and encourages efficient business practices including a new focus on reducing natural resource use. Investments in local renewable energy systems, facility improvements, footprint reduction, and sound metrics are beginning to form a firm foundation to advance sustainability. In addition, and just as critical to success, is the developing partnership between science (advancing sustainability) and operations (implementing sustainability). This synergy is necessary to cultivate a new environment to bridge the gap between mission growth and increasing resource use beyond capacity. The Laboratory will focus within facilities that have a potential to successfully impact energy and water reduction goals; however, these investments will not significantly impact the GHG reduction goal. In order to meet the sustainability goals, the Laboratory will need to pursue a combination of additional investment in renewable energy, green construction practices, and operational improvements for energy efficiency.

SECURITY INFRASTRUCTURE

NEAR TERM (FY2013-2022)

In the near term, the Laboratory's Safeguards and Security (S&S) Program will continue to consolidate security assets and replace and improve outdated infrastructure to effectively support the Laboratory's missions. The primary focus

8. DOE owned and operated assets

will be consolidation of SNM at TA-55. The construction and activation of the CMRR-NF was expected to complete the Laboratory's consolidation of nuclear facilities into one CAT-I SNM area located within the Pajarito Corridor. The project start date, however, has been delayed five years, making continued operations (CAT III) at the existing CMR a necessity in the out-years. The secondary S&S focus will be the protection of classified matter, property, and personnel outside of the Pajarito corridor.

The following major initiatives, either under way or in the planning phases, are necessary to achieve NNSA's strategic goals and objectives over the next decade. These initiatives are either funded or submitted to NNSA in the FY2013–FY2018 FYNSP. Prioritization within the TYSP submission is the same as the prioritization within the current Non-Recurring Projects and Procurements List as was submitted to NA-70.

Nuclear Materials Safeguards and Security Upgrades Project Phase II (funded): Facility security improvements resulting from NMSSUP Phase II should be completed during early FY2013. These physical and access control infrastructure improvements will enhance the site security posture, and coupled with NNSA threat guidance changes, will result in more cost effective Protective Force (PF) resources. Additionally, NNSA is considering project scope expansion to further enhance security and provide benefits to the weapons program operations by increasing portal throughput and providing automated systems for material surveillance (Post 116 upgrades project).

Protective Force Training Facilities (funded): Construction of the PF Tactical Training Facility is nearing completion with an expected occupancy by mid FY2012. The Indoor Firing Range is nearing completion with expected occupancy by mid FY2012. Outdoor firing range upgrades are in design with construction scheduled to begin during FY2012, and completion is expected in early FY2013. Completion of the three PF training facilities will result in a complete suite of state-of-the-art training facilities sufficient for a robust PF training environment in the near- and long-term.

Post Automation 439 (funded): This project will eliminate the use of the PF manning. The project will install double scissor gates (one inbound and one outbound) on a Limited Area (LA) access control point in TA-16.

Legacy Field Panel Replacements (Funding Request FY2013-FY2016): Four separate projects for the replacement of legacy field panels with modern Argus field equipment, which will upgrade the site's field panels to a current Argus configuration. The legacy field panels are obsolete and require excessive maintenance. They do not support the increased processing speeds of new Argus equipment and they require special software gateways to communicate with Argus. No spare parts are available, except those obtained by cannibalizing existing units. All these factors cause inherent problems for system effectiveness and reliability. Estimate is based on a previous analysis and plan developed for this replacement, and includes craft labor and materials for project completion.

Laboratory Strategic Protection Program (Funding Request FY13- FY18): The Laboratory, in consultation with Los Alamos County, would construct a split road system at TA-3 for public/Laboratory use. This would allow the Laboratory to close vehicle access portals (VAPs) 4, 6 and 17/18 to the public and better control access. Shipping/Receiving and a satellite Badge Office would be moved outside the Laboratory Property Protection Area (PPA). The VAPs would be covered by closed-circuit television for assessment purposes and would be augmented by barrier systems that could be activated in the event a vehicle "ran" the gate. Existing resources would be evaluated to determine realignment of staffing for the new perimeter. Conceptual design is under way, and if funding becomes available, a more precise design package and estimate will be completed during FY2012.

Post 116 Upgrades (Funding Request FY2013- FY2014): This project will renovate Post 116 to provide more efficient operation, replace outdated systems, and install new Argus capability. Primary scope includes; 1) Renovation of Post 118 to accommodate PF-4 access while P116 is being renovated; 2) renovation of Post 116 to include replacement of most existing systems, installation of x-ray systems, SNM monitors, Positive Personnel Identification and Verification booths, Argus compatibility, and explosives detectors. Also, cosmetic repairs to the internal guard booth, life safety upgrades and other minor improvements; 3) development of security infrastructure to include the installation of Argus field panels (AFPs), redundant signal wire, secondary Alarm Station at TA-55/PF-142 and the installation of Argus compatible readers at the TA-55 muster area; and 5) development of redundant power from TA-55/PF-142 to post 116. This upgrade will make Post 116 equipment fully compatible with all of the upgrades currently occurring as a part of the NMSSUP II project.

Homeland Security Presidential Directive (HSPD)-12 Compliance (Argus) (Funding Request FY2014- FY2016): Re-placement of 200 Argus stations based on a preliminary plan, including estimates of craft labor and materials. This plan and estimate are based on the mandated 3-year

completion deadline. Estimate is based on NA-70 guidance that the Argus equipment ((Remote Access Panels (RAPs), AFPs, etc.) are to be provided by Lawrence Livermore National Laboratory (LLNL) Argus depot at no cost to the Laboratory.

Security Office Building (Funding Request FY2015): Construct of a secure office building of approximately 13,000 square feet with accommodations for 50-60 staff at TA-3. The new building would replace seven outdated transportable buildings adjacent to building 03-0440 and house staff that currently occupy the existing transportable offices. The cost of construction is estimated to be approximately $7.0 million, with a total project cost of $9.9 million. The proposed site requires no major utility or site work and will utilize existing adjacent parking. The new facility will enhance work efficiencies, provide appropriate work areas, and be constructed to current DOE standards for energy use and sustainability.

PF-4 Compartmentation (Funding Request FY2013-FY2015): This project will provide Argus-based compartmented security to the PF-4 laboratory area. The initial plan creates twenty (20) security compartments based on material balance areas in PF-4. The work scope includes the following: 1) development of an AFP complex in rooms 181 and 181a at PF-3. 13 AFP complexes will be installed with redundant power, additional cooling and communication to both the secondary alarm system (SAS) and central alarm system (CAS). A project assumption is that infrastructure to the SAS and CAS will be available through a separate project; 2) installation of all physical conduit and wiring infrastructure inside PF-4; 3) replacement of approximately 69 doors with fire rated doors, including egress/security hardware and various mechanical modifications to maintain proper air/pressure balance; 4) installation of RAPs on both sides of each impacted door; and 5) development of new software to support the PF-4 compartment concept.

PF Headquarters Building (TA-16) (Funding Request FY2017): Replace the existing TA-64 facility. Replacement facility would provide for centralized PF activities and improve logistics to facilitate on-shift and off-shift training and reduce time associated with officer rotation and transition. The indoor range and the tactical training facility are currently located at TA-16.

PF Muster Room / Locker Area/Armory (TA-16) (Funding Request FY2018): Construction of a new facility to centralize PF activities and allow for more versatility and efficiency in providing on- and off-shift training, thereby reducing time associated with officer rotation and transition. The indoor range and the tactical training facility are currently located at TA-16.

Electromagnetic Pulse (EMP) (Funding Request FY2014-FY2015): Fabrication of protective filters to shield sensitive equipment from electromagnetic pulse attacks from malicious, industrial or natural causes. The EMP project will provide protection to vital security equipment from short and medium length electro-magnetic pulses. The scope of this effort will include design, development, testing, parts procurement, and fabrication of 130 passive filters. After successful testing, several units will be placed in service and monitored for several months. After the filters successfully pass this phase of acceptance, the filters will be installed in key electronic equipment at the Central and Secondary alarm stations. Optional work includes remote monitoring of the filters for attacks and installation of 94 filters in the Perimeter Intrusion Detection Alarm System bed detection system. A class three estimate is being prepared. $5M, costed as an expense funded project with a current study to cost the work as a capital equipment project.

Permanent Vehicle Inspection Station (Post 10) (Funding Request FY2018): Replace the current temporary station with a permanent facility to include vehicle cover and roadwork to re-rout designated traffic.

Replacement Badge Office: Replace the current the Laboratory badge office to include movement outside of the Jemez VAP containment area.

HSPD-12 Compliance (Apollo): Labor, equipment, and material costs to convert ~ 1,200 Apollo access points. Estimate based on a preliminary plan and analysis, including gross estimates of craft labor and materials. This plan is based on the mandated 3-year completion deadline. Argus stations are not included.

TA-3 Security Footprint: The Laboratory's security program is continuing to re-examine the security of the Laboratory's primary Non-CAT-I area. Possible changes to campus security include transitioning the current TA-3 LA from one large LA to a number of smaller LAs. This would result in a significantly smaller security footprint and better access to all facilities for both classified and unclassified users. In conjunction with the demolition of the old Administration Building (03-0043), security posts that provided access control to a larger area of TA-3 will be replaced by access controls on two facilities, allowing the TA-3 area to be more open.

LONG TERM (FY2023-2037)

During this time period, the Laboratory's security program should be positioned to efficiently and effectively protect the CAT-I assets. Enhancements should allow for the protection of the CAT-I material with minimal PF manpower and minimal recurring physical and system maintenance costs over the long term. Furthermore, proposed reductions to security area footprints and system upgrades necessary for compliance with Argus and HSPD12 requirements should enable efficient and effective protection of classified matter with minimal physical and system maintenance costs in the long term.

Right, Below: Completion of the Tactical Training Facility, the Indoor Firing Range, and the Outdoor Firing Range upgrades will provide a complete suite of state-of-the-art training facilities sufficient for a robust protective force training environment in the near- and long-term.

ACRONYMS

ACRONYMS	
AFP	Argus Field Panel
AOC	area of concern
ASC	Advanced Simulation & Computing Campaign
BTF	Beryllium Technology Facility
CAS	central alarm system
CAT	Category
CBFI	Capability Based Facilities and Infrastructure
CD	critical decision
CINT	Center for Integrated Nanotechnologies
CMR	Chemistry and Metallurgy Research Facility
CMRR	Chemistry and Metallurgy Research Replacement Project
CMRR-NF	Chemistry and Metallurgy Research Replacement Nuclear Facility Project
CP	Counter-Proliferation
CPIBP	Corporate Physical Infrastructure Business Plan
CT	Counter-Terrorism
DARHT	Dual Axis Radiographic Hydrodynamic Test Facility
DM	deferred maintenance
DOE	Department of Energy
DOS	Department of State
EM	Environmental Management
EMP	electromagnetic pulse
EMS	Environmental Management System
F&I	facilities and infrastructure
FCI	facility condition index
FDP	Facility Disposition Program
FIMS	Facilities Information Management System
FIRP	Facilities and Infrastructure Recapitalization Program
FIT	Facility and Infrastructure Transformation
FY	fiscal year
FYNSP	Future Years Nuclear Security Program
GHG	greenhouse gas
GPP	general plan t project
GSF	gross square feet
HE	high explosives
HPSB	High Performance Sustainable Building
HSPD	Homeland Security Presidential Directive
IPF	Isotope Production Facility
kV	Kilovolt
LA	Limited Area
LACES	Los Alamos County Eco Station
LANS	Los Alamos National Security, LLC
LANSCE	Los Alamos Neutron Science Center
LEED	Leadership in Energy and Environmental Design
LEP	Life Extension Program
LINAC RM	Linear Accelerator Risk Mitigation
LLNL	Lawrence Livermore National Laboratory
LTS	Long-Term Environmental Stewardship Program
M&O	management and operating (contractor)
MaRIE	Matter-Radiation Interactions In Extremes
MC	mission critical
MD	mission dependent
MDA	Material Disposal Area
MIP	Maintenance Implementation Plan
MSL	Materials Science Laboratory
MTS	Materials Test Station
MW	megawatt
MVA	Megavolt Ampere
NCP/T	Nuclear Counter-Proliferation/ Terrorism Facility
NE	Office of Nuclear Energy
NHMFL	National High Magnetic Field Laboratory
NMD	non mission dependent
NMED	New Mexico Environment Department

NMSSUP	Nuclear Materials Safeguards and Security Upgrades Project
NNSA	National Nuclear Security Administration
NPR	Nuclear Posture Review
NSF	National Science Foundation
NSSB	National Security Sciences Building
OSF	Other Structures and Facilities
PF	Protective Force
PPA	Property Protection Area
QMU	quantification of margins and uncertainties
R&D	research and development
RAP	Remote Access Panels
RLUOB	Radiological Laboratory Utility and Office Building
RLWTF	Radioactive Liquid Waste Treatment Facility
ROD	Record of Decision
RPV	replacement plant value
RTBF	Readiness in Technical Base and Facilities
S&M	surveillance and maintenance
S&S	Safeguards and Security
SAS	Secondary Alarm System
SC	Office of Science
SCIF	sensitive compartmented information facility
SERF	Sanitary Effluent Reclamation Facility
SNM	special nuclear material
ST&E	science, technology, and engineering
SUSTAIN	Sustainable Science, Technology, and Innovation facility
SVE	soil vapor extraction
TA	technical area
TRP	TA-55 Reinvestment Project
TRU	transuranic
TYSP	Ten-Year Site Plan
U.S.	United States
VAP	vehicle access portal
WETF	Weapons Engineering Tritium Facility
WIPP	Waste Isolation Pilot Plant
WME	Weapons of Mass Effect

REFERENCES

Defense Programs memorandum of October 28, 2009, *"Updated Readiness in Technical Base and Facilities (RTBF) Mission-Critical List for FY2010."*

Department of Defense, *Nuclear Posture Review Report (NPR)* (April 2010).

Department of Energy, *Amended Record of Decision concerning the Nuclear Facility portion of the Chemistry and Metallurgy Research Replacement project (CMRR-NF)* (October 2011).

Department of Energy, *Contractor Protective Force,* **DOE M 470.4-3A** (November 2008).

Department of Energy, *Departmental Energy, Renewable Energy and Transportation Management* , **DOE O 430.2B** (February 2008).

Department of Energy, *Departmental Sustainability*, **DOE O 436.1** (May 2011).

Department of Energy, *DOE Strategic Plan* (May 2011).

Department of Energy, *Graded Security Protection (GSP) Policy,* **DOE O 470.3B** (August 2008). This Order is classified as (Secret // RD // NOFORN) and will not be available on the Directives portal.

Department of Energy, *Land and Facility Use Planning,* **DOE P 430.1** (July 1996).

Department of Energy, *Program and Project Management for the Acquisition of Capital Assets,* **DOE O 413.3B,** (November 2010).

Department of Energy, *Real Property Asset Management,* **DOE O 430.1B** Chg1 (September 2003).

Department of Energy, *Record of Decision: Complex Transformation Supplemental Programmatic Environmental Impact Statement (SPEIS),* **DOE/EIS-0236-S4** (December 2008).

Department of Energy, *Record of Decision: Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory in the State of New Mexico,* **73 FR 55833** (September 2008).

Department of Energy, *Record of Decision: Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory in the State of New Mexico,* **74 FR 33232** (July 2009).

Department of Energy, *Safeguards and Security Program Planning and Management,* **DOE M 470.4-1 Chg 2** (October 2010).

Department of Energy, *Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory,* **DOE/EIS-0380** (May 2008).

Department of Energy, 2011 *Strategic Sustainability Performance Plan (SSPP)* (October 2011).

Department of Energy, *Supplemental Environmentl Impact Statement for the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory,* **DOE/EIS-0350-SA-01** (January 2005).

Department of Energy and State of New Mexico Environmental Department, *Los Alamos National Laboratory Framework Agreement: Realignment of Environmental Priorities* (January 5, 2012)

International Standards Organization, *Environmental Management Systems,* **ISO 14001:2004**.

Los Alamos National Laboratory, *50-Year Environmental Stewardship Plan for Los Alamos National Laboratory* (June 2012).

Los Alamos National Laboratory, *FY2010 Executable Energy Management Plan,* **UI-Plan-002** (December 2009).

Los Alamos National Laboratory, *FY2012 Site Sustainability Plan (SSP),* **UI-PLAN-020** (December 2011).

Los Alamos National Laboratory, *Global Security: The Los Alamos National Laboratory Program to Reduce Global Threats through Innovative Science and Technology,* **LA-UR-10-05705** (September 2010).

National Nuclear Security Administration, *Construction Working Group–Integrated Construction Alignment Plan* (November 2010).

National Nuclear Security Administration, *Corporate Physical Infrastructure Business Plan for FY2011-FY2041 (CPIBP)* (March 2011).

National Nuclear Security Administration, *FY2012 Stockpile Stewardship and Management Plan* (April 2011).

National Nuclear Security Administration, *NNSA Strategic Plan* (May 2011).

Office of Management and Budget, *Fiscal Year 2013 Budget Request of the United States Government*.

Office of the President of the United States, *Federal Leadership in Environmental, Energy, and Economic Performance,* **EO 13514** (October 2009).

Office of the President of the United States, *Federal Real Property Asset Management,* **EO 13327** (February 2004).

Office of the President of the United States, *Strengthening Federal Environmental, Energy, and Transportation Management,* **EO 13423** (January 2007).